
UNIT 8 ACCESS TO NATURAL RESOURCES

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8.1 INTRODUCTION

One of the causes for Social Conflicts and Violence everywhere has been claims and denials for use of natural resources. Increase in population and growth of consumerism have been causing scarcity of resources. Particularly those whose very existence depends on natural resources are facing serious problems. Most of the world's poor are rural. And most of the rural poor depend on agriculture or are otherwise dependent on natural resources in generating their livelihoods. Thus the linkage between rural poverty and natural resources is necessarily a close one. But the full potential resulting from this linkage cannot be realised unless the poor have improved and more equitable *access* to those resources and the poor are better able to *sustainably manage* their resource base.

Access by the poor to natural resources (land, forests, water, fisheries, pastures, etc.), is essential for sustainable poverty reduction. The livelihoods of rural people without access, or with very limited access to natural resources are vulnerable because they have difficulty in obtaining food, accumulating other assets, and recuperating after natural or market shocks or misfortunes.

Aims and Objectives

After reading this unit, you would be able to understand:

- importance of access to natural resources;
- emerging threats and opportunities in accessing natural resources; and
- key challenges to enhancing access to, and sustainable management of, natural resources.

8.2 ACCESS AND ITS IMPORTANCE TO NATURAL RESOURCES

Poor people depend on a wide set of primary natural resources. Various frameworks can be employed to usefully distinguish these resources. One recent approach distinguishes between *provisioning* services (those responsible for supporting human life), *regulating* services (basic ecosystem processes), *cultural* services (nonmaterial ecosystem benefits), and *supporting* services (basic long-term ecosystem services) (Millennium Ecosystem Assessment, 2005). This is a useful approach because it focuses on the specific functions that ecosystems deliver, and thus on the sustainability of those services in supporting human livelihoods: providing basic soil and water resources for crop and livestock production; regulating air, water, and climatic processes; supporting the biophysical processes of photosynthesis, soil formation and nutrient cycling; and helping provide a diversity of social, cultural, spiritual, recreational aspects to life. More specifically, we can identify several key natural resources on which we all, including the poor, are dependent: land, water, forests, fisheries, climate, crop genetic resources and mineral resources.

8.2.1 Access

Access is a central criterion to assuring sustainable rural livelihoods. Natural resources become natural “assets” when access is assured, either through asset ownership or other forms of secure access and control. Natural capital or natural assets are often considered one of the five forms of capital, the others being financial capital, physical capital, social capital, and human capital (Figure 8.1) (Carney, 1998).

Amartya Sen (1981) distinguished the production-based *availability* of food from household *access* to food. So too, is it critical to distinguish between the physical *availability* of natural resources and the *access* that people, poor people in particular, may, or may not, enjoy. Importantly, it is access to resources, not the supply of resources or their overall availability, that determines whether poor men and women will be able to make the most of the opportunities they have to enhance their livelihoods.

Resources without the rights to access the benefits potentially accruing to resource ownership and control are not assets (Boyce and Pastor, 2001). Access is determined by formal and informal rules and institutions that govern who can use natural assets, when, where, how and for what purposes.

Natural resources vary widely in the rules that govern access to them. Access to some resources is primarily held by individuals, while access to other resources may be shared across larger groups, including the state, and some resources are effectively not held by anyone. Such open access resources, including many forests and fisheries, are among

those facing the greatest current pressures due to growing population, accompanying resource demands, and the common lack of effective institutions that govern access. Because access entails rights, it is also fundamentally affected by social and political processes reflecting the distribution of power in communities and societies (including dimensions such as gender and conflict), by market forces reflecting the distribution of wealth, and by environmental forces which are often influenced by human activity.

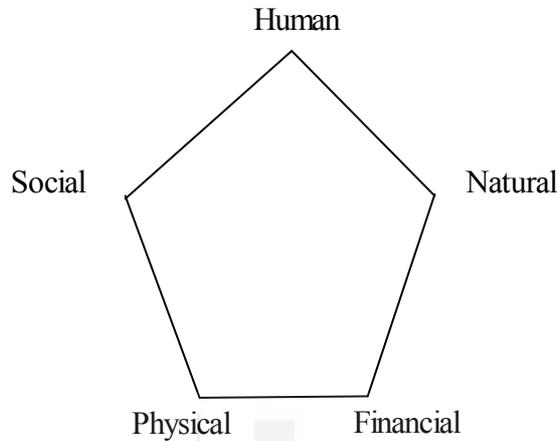


Figure 8.1: The Capital Asset Pentagon

8.2.2 Importance of Access to Natural Resources

Access to natural resources (e.g., natural assets) – along with access to the other four asset categories identified above – is the key to determining the range of livelihood opportunities available to all individuals and households. The larger the asset base, the less constrained the choices available to households and the greater the ease of substituting one form of capital for another. The more limited the asset base, the more constrained the choice set. The household’s asset base, including access to natural resources, thus fundamentally conditions the production and exchange decisions it makes (Figure 8.2). The outcomes of these decisions – as represented by levels of household income, assets and capabilities – in turn influence the consumption and investment decisions of these same households. And those consumption and investment tradeoffs made by those households influence, in turn, the portfolio of natural and other resources to which households have access and the decisions they make in future periods.

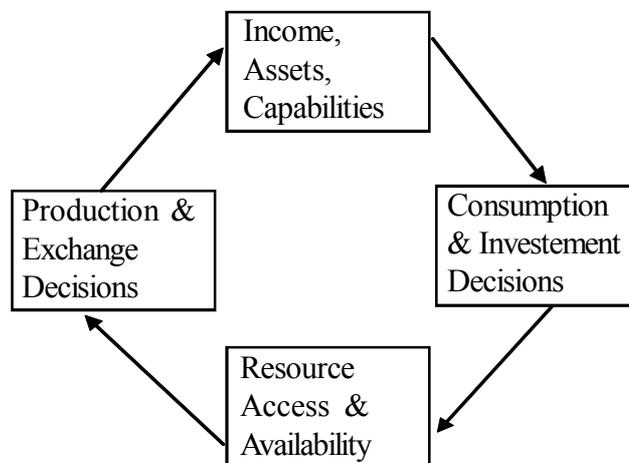


Figure 8.2: Farm Household Assets and Choices

Source: Adapted from Maxwell and Wiebe, 1998.

8.3 DEPENDENCE ON NATURAL RESOURCES

The livelihoods of the rural poor are disproportionately dependent on crop and animal agriculture and other natural resources – notably, forests, fisheries and genetic diversity – as well as the underlying environmental services that sustain these resources. Household income that is dependent on natural resources – “environmental income” – comes from a wide diversity of agricultural sources, both in cultivated settings (cropland and some grazing) and “wild” or uncultivated sources, including forests, fisheries (marine and inland), wetlands, and natural grasslands.

8.3.1 Vulnerable to the Shocks

As a result of this dependence on primary natural resources, the rural poor are especially vulnerable to the shocks that emanate from many sources. The rich, on the other hand, can more easily substitute physical, financial and human capital for natural capital, and thus have a better “fall-back” mechanism that helps reduce vulnerability. The vulnerability of the rural poor is a prime distinguishing aspect of their livelihoods and lives. Environmental shocks include drought, floods, earthquakes, and climate change, among others. The impacts of these shocks can be mitigated, at least partially, by interventions such as irrigation systems, conservation agriculture practices, crop breeding strategies, and many other technologies and management interventions.

8.3.2 Poverty Trap

An additional threat to the extreme poor is represented by rural “poverty trap” mechanisms (Nelson, 1956). The extreme poor, by definition, lack adequate access and capabilities to take advantage of natural capital and other forms of capital. As a result, they may have to mine the soil, overfish, overhunt and deforest in order to meet short-term needs (Sachs, 2006). Without adequate access and resources to reinvest in the quantity and quality of productive assets – or at least to create a “safety net” of assets to mitigate future shocks – poor households face “asset poverty”, a particularly precarious position. Escaping this position may only be possible through selling one’s labour, often at unfavourable prices, in local markets, leaving households both poor and dependent (IFAD, 2001).

8.3.3 Common Property and Open Access Resources

It is important to distinguish between common property resources and open access resources, although these terms are often used interchangeably. Common property resources are typically allocated under customary property rights and tenure systems that provide rules governing the rights to and use of resources. Open access resources lack such rights and rules and are open to all. Common property resources have, in many cases, been sustainably managed for generations, but where tenure systems are weakened or where governance and enforcement mechanisms are ineffective, they may be used and exploited in a *de facto* open access manner. Access to these resources – including many forests, fisheries, marine resources, grasslands, etc. – is important to the livelihoods of the poor in many countries.

8.4 EMERGING THREATS AND OPPORTUNITIES IN ACCESSING NATURAL RESOURCES

Access to natural resources is conditional on and limited by many factors: population

density and growth, rural to urban migration, forces of globalisation, changes in income, presence of political or military conflicts, existing tenure and governance systems, and ongoing changes in institutions, laws and policies. In recent years, other forces have emerged which represent, simultaneously, threats and opportunities to different populations.

8.4.1 Climate Change and Access and Management of Natural Resources

Climate change has become an important concern to many policy makers as the increase in greenhouse gases in the atmosphere – including CO₂, methane, N₂O, and SO₂ – contributes to an overall warming of the Earth's atmosphere due to the burning of fossil fuels, deforestation and other human activities. The effects of climate change on land and water resources can be traced back to six factors:

- 1) an increase in global mean temperatures,
- 2) gradual changes in the amount and frequency of precipitation,
- 3) increases in the frequency and intensity of extreme weather events such as droughts, hurricanes, etc.,
- 4) greater weather variability,
- 5) the effects of CO₂ fertilization, and
- 6) a rise in sea levels, resulting in salt water intrusions and coastal flooding.

8.4.2 Higher Commodity Prices and Expanded Production of Bio-fuels

Higher global commodity prices since 2003 have changed – in some cases dramatically – the economic picture facing farmers and food consumers in all nations. Higher prices have been experienced for both energy and agricultural commodities. Particular attention has been focused on liquid bio-fuels for transportation, especially bio-ethanol (produced from crops such as sugar and maize) and biodiesel (produced from crops such as palm oil and rapeseed). These have the potential to mitigate climate change by reducing emissions of greenhouse gases, lowering dependence on imported oil for net oil importers, and in stimulating rural development by increasing farmers' incomes.

8.5 KEY CHALLENGES TO ENHANCING ACCESS TO AND SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Several clusters of challenges are faced by the poor in terms of enhancing access to, and improving management of, natural resources. These challenges are:

8.5.1 Expanding Access to Natural Resources

A country may possess an adequate – or even an abundant – supply of land, water, forests and other natural resources, but this does not mean that all people necessarily enjoy adequate, or even minimal, *access* to those resources. There are many countries, including some of those with great resource abundance, where the ability of the poor to access resources is heavily constrained and highly unequal, and where, as a consequence

of these and other factors, poverty is severe and widespread. The specific challenges of expanding natural resource access are many: gaining access to additional cropland; gaining reliable access to open access and common property resources such as water, forests and fisheries; expanding access on the part of those in society whose prior access has been most constrained, such as women.

Expanding Access to Land

The livelihoods of nearly 9 out of 10 rural people (World Development Report; 2002) depend in whole or in part on agriculture. Consequently, assuring expanded access to land remains the centerpiece of many efforts to improve rural livelihoods. Expanded and more secure land access remains key, in many settings, to making agriculture more productive and capable of generating not only food but also a major share of household incomes. State-led Land Reform Programmes have been a common policy for increasing access to land among the poor.

Expanding Access to Water

The challenges of increasing access to resources that are prone to common property and open access problems – including water, forests and fisheries – present many commonalities. In each case, increasing population growth, expanding demands on resources, and resulting increasing scarcity problems create major challenges to increasing access and enhancing the security of access. This is particularly true in customary tenure systems, where rules are typically not formalised through statutory law. In settings where customary systems are weakening, the likelihood of conflict over resource use is even greater.

Increasing water access in *rain fed areas* is also critically important to improving rural livelihoods and decreasing poverty. A majority of the world's poor are dependent on rain fed agriculture for growing food, generating incomes, and livelihood security (IWMI, 2007).

Expanding Access to Forests

As with water resources, forests have come under increasing pressure globally due to growing demands for timber and other forest products as well as the livelihood needs of those living in and around forests. As in the case of water management, in most countries, the state plays a major – very often, a dominant – role in forest ownership and managing use.

Expanding Access to Fisheries

Fisheries, likely more than any other natural resource, suffer from chronic problems of open access. The livelihoods of approximately 200 million people depend on fisheries – an estimated 41.4 million of these are full- and part-time fishers, 20 percent of whom earn less than \$1 (U.S.) per day (World Bank, 2008). A large proportion of the world's fisheries are already heavily exploited.

Expanding Access to Crop Genetic Resources

The crops and varieties that farmers plant in their fields are a key determinant of their well-being, through the production of food for consumption, generating income from sales, as well as providing cultural and social benefits. Farmers' choices of crops and varieties to plant are driven by their access to crop genetic resources. These resources

provide the fundamental mechanics of transforming soil, water, and sunlight into agricultural products of value to humans (Day-Rubenstein, et al., 2005). Crop genetic resources are embodied in the seeds farmers use to plant their crops (Smale, 2005). These genetic resources are the genetic coding that expresses itself in the genotypic and phenotypic characteristics of crops – the length of the growing season, drought tolerance, yield potential, etc. Crop genetic resources are a quasi-public good; one farmer planting a variety does not preclude another from planting the same. However, seeds are private goods – two farmers cannot plant the same seed. This divergence between the two means that the issues of access also differ. Access to seeds and the crop genetic resources they embody is a function of both the *demand and supply* of varieties and seeds.

Increasing Women's Access to Land and Resources

One of the principal factors limiting access to natural resources by the poor is associated with gender differences. Women play many key roles in many aspects of natural resource management (FAO, 2008) – they have a central role in agriculture and conserving soil fertility through crop rotation, fallowing, intercropping, mulching and other soil conservation practices; they are most often the principal collectors, users and managers of water in the household, as well as farmers of both irrigated and rain fed lands. They play a central role, and provide much of the household labour, in animal husbandry and marketing. They have a central role in the collection and use of non-timber forest products, including fuel wood, fodder and medicinal products and in the processing and marketing of these and other forest products. In small-scale fisheries, women are particularly heavily involved in fish preservation, processing, and marketing, and have an especially key role in aquaculture production.

8.5.2 Increasing Security of Access to Natural Resources

Regardless of the specific type of property right or rules of access in given instances, it is assuring *security of access* that is often the central challenge facing poor rural people. This is particularly the case in the many country settings in which access to resources is governed by customary tenure and use systems, where these systems have not been formalised by statutory law, and where these systems (and the underlying resources to which they apply) are facing immediate threats. Security of access is a particular obstacle in the case of open access resources – water, forests and fisheries – where use and access may be increasingly problematic.

Increasing Security of Access to Land

In terms of increasing security of access to land, whether as part of state-led land reform programmes or contemporary market-assisted approaches to increasing access to land, the introduction of land registration and titling systems can greatly enhance security of access and strengthened private property rights.

Increasing Security of Access to Water

The allocation of water resources is typically governed by cross-cutting statutory and customary tenure arrangements in most developing countries, and the allocation of water resources to individuals is typically subject to use rights, rather than permanent ownership rights. Unlike the case of irrigated land and other agricultural land, private rights to secure access to water, forests and fisheries are highly limited in most developing countries.

Rights to water often hinge on the particular constellation of allocation mechanisms applicable in given instances. Water rights are often overlapping and changing over time; the key policy challenge is often to determine the optimal mix, in any particular setting, of private, customary and state-based rights.

Increasing Security of Access to Forests

The dominant share of the world's forests is in public ownership, meaning that the state has a central role (at least nominally) in providing secure access forest resource. As with water resources, customary user rights to forests are complex, reflecting the wide diversity of forest resources. Different strands of forest access and use rights can pertain to the rights to harvest wood products, non-timber forest products, the right to gather dead wood, and the right to hunt wildlife. Beginning in the late 1970's, and particularly since the late 1980's, there has been an increasing trend toward the strengthening of customary rights to forestland on the part of local communities and indigenous groups.

Increasing Security of Access to Fisheries

Fishery resources are facing significant threats around the world. In no other area has the institutional and policy environment adapted more in recent years in an attempt to deal with these threats. National regulatory frameworks are highly heterogeneous and have changed over time as fisheries have become more highly exploited and more valuable (Shotton, 1999). As for other resources, numerous efforts have been made to formalise customary systems of fisheries management although, due to the nature of this resource, this presents many obstacles.

Security of Resource Access in Conflict and Post-conflict Situations

Access to natural resources has long been at the heart of conflicts at local, national and international levels. In most cases, resource-related conflicts are part and parcel of the normal circumstances encountered by the poor in everyday life – dealing with conditions of resource scarcity due to high population growth and growing intensification of input use, the migration of new populations demanding access to resources, the increasing degradation of soils, forest, water and fishery resources, etc. Expanding access to natural resources by the poor (or any group) will, in an environment of increasing scarcity, almost inevitably lead to a growing opposition of interests.

8.6 IMPROVING SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

The sustainable management of natural resources is critical to the needs of the poor for several reasons. The rural poor are disproportionately dependent on natural resources; thus sustaining their livelihoods depends on the continued availability and sustainable management of those resources. Since most of the continuing and emerging threats to sustainability are themselves human-induced – population growth, global climate change, agricultural intensification, deforestation, fisheries depletion, and the narrowing of the crop genetic base – then the main practical challenge for policy and management is how to alter current human behavioural patterns in such a way as to make it more likely that the path of sustainable resource use will be achieved.

8.6.1 Sustainable Agriculture and Natural Resource Management

As a means to address food security, livelihood improvement, and land and resource degradation, “sustainable agriculture” (SA) technologies and related natural resource management (NRM) practices have often been promoted in both favoured and less-favoured landscapes. A formal definition often characterises sustainable agriculture having five major attributes: it is resource-conserving (of land, water, plant and genetic resources), environmentally non-degrading, technically appropriate, and economically and socially acceptable. As a practical matter, these technologies, practices and systems are often considered to 1) use less external off-farm inputs such as fertilizers, pesticides, and mechanical inputs; 2) use improved management techniques, and 3) employ locally available labour and natural resources as well as externally purchased inputs in complementary and synergistic fashion. Sustainable agricultural practices are often adopted by farmers as a means to address soil erosion, water scarcity, loss of forest resources, and other examples of increased natural resource degradation and scarcity.

Water Management in Irrigated and Rain-fed Areas

The fact that rural households commonly face problems of water scarcity means that perhaps in no other area are management improvements more important than in improving water management. It is useful to distinguish between improved water management in irrigated versus rain-fed areas. In irrigated areas, one of the key developments over the past 20 years has been the growth of “participatory irrigation management” (PIM) approaches to water management.

In the many household-level settings in *rain fed areas* where access to adequate water supplies is the main constraint to agricultural growth, increasing this access to water can be accomplished in a variety of ways. Among the most important mechanisms are improving plant water availability through reducing surface runoff and maximizing plant water uptake capacity (IWMI, 2007). This can be accomplished through practices and technologies that increase the productivity of existing water supplies (mulching, drip irrigation, improved crop management) and by capturing more water to begin with.

Joint Forest Management

Forests, like water and fisheries, suffer from chronic open access problems. Over two decades (in some countries, much longer), efforts have been made in many countries to devolve forest management to private individuals and local community groups as a way of dealing with those problems. Joint forest management systems tend to be most successful when they are characterised by: definable boundaries; the presence of scale economies in production and ease of use; when the resource is important to meeting local users’ needs; when the benefits are shared equitably; when the local community is not too heterogeneous and does not have too many conflicting interests; when local leadership has self-interests that coincide with those of local users; when the local arrangement is built on existing institutions; and when the local arrangement is sufficiently adaptable to respond to changing economic conditions, such as changing prices for outputs and increasing costs.

Co-management in Fisheries

The management of fisheries shares some of the same trends as land, water and forest management, but there are also some major differences. There has long been through involvement of national governments in fisheries policy and management, both in marine and inland fisheries. But nowhere has the failure of top-down state-led administrative

structures been greater. The current global fisheries crisis as a result of severe open access-related problems is closely attributable to a crisis in governance (World Bank, 2004).

Decentralisation of Natural Resource Access and Management

With regard to common property and open access resources as a whole, one of the central themes is the widely acknowledged failure of top-down centrally administered approaches to resource management (particularly for common property resources). In response to these limitations, one of the key developments over the past two decades or more – and one pertaining to land, water, forest and fisheries management at all levels – has been growing commitment to the involvement and empowerment of private resource users and local communities in managing resources that have been allocated by the state or by statutory law.

Tradeoffs in Sustainable Resource Management

It has been common in much of the development literature and among development practitioners to highlight “win-win” outcomes (higher household production and improved food security along with lower poverty), or even “win-win-win” outcomes (lower environmental degradation as well).

8.6.2 Enabling the Poor to Take Advantage of Evolving Market

One of the means by which the poor can potentially improve resource access and sustainable management is through market-based mechanisms as they apply to land, water, forests and other natural resources. The growing interest in markets for natural resources and environmental services stems from several factors. Market mechanisms are, in large part, self-regulating and thus provide an alternative to more “top-down” and bureaucratic and institutionally-based resource allocation mechanisms which are prone to arbitrary and inequitable decision-making, are influenced by the distribution of political power, and, in many cases, are dominated by graft and corruption.

Payments for Environmental Service

Paying for the provision of environmental services is a recent policy innovation that is attracting much attention in both developed and developing countries. The innovation involves a move away from command-and-control environmental policies and towards the use of market incentives to obtain more efficient environmental outcomes, and rewarding providers of environmental services that did not receive compensation in the past.

Water Pricing and Water Markets

Water is a unique natural resource in many respects – due to its mobile nature, the extent to which rights to its access may (or may not) be tied to land, in the mix of public goods and private goods that its use entails, and in other respects. In the current environment facing many nations of increasing water scarcity due to expanding populations, rising food demands, increasing commodity prices and climate change, there is increasing interest in alternative mechanisms to solve chronic problems associated with water access, allocation and management. This has led to growing interest in water pricing, water markets, and transferable water rights as mechanisms for more efficiently allocating and better conserving scarce water resources.

The introduction of *water pricing* typically has one of two primary objectives – increasing incentives for conservation by having the price of water reflect its scarcity value, and

raising revenues for construction, operation and maintenance of water supply and irrigation systems.

Water markets typically refer to the formal market-based exchange of water rights (as opposed to spot water markets which may be used to temporarily transfer water use among neighboring farmers or other members of a water users' group, for example).

Forest Certification and Markets for Non-Timber Forest Products

Forest certification was developed as a strategy to address deforestation in tropical forests, but it is not a strategy *per se* to combat deforestation; rather, it is an instrument to promote sustainable forest management (SFM) and informed consumption of wood and other forest products (Simula, 2005).

Certification, in some countries, also extends to *non-timber forest products* (NTFP's) – forest-based food, fuel, construction materials and medicines – on which the rural poor are often as (or more) heavily dependent than they are on timber.

Markets for Seeds and Crop Genetic Resources

Market-based approaches are having major impact on both the development of crop genetic resources, as well as the dissemination of seeds. In recent years there has been a major shift in funding sources for plant breeding from the public to the private sector. The public commons of genetic resources is being increasingly privatized through more clearly defining and implementing intellectual property rights (IPRs) on plant genetic resources. Intellectual property rights over plant genetic resources can take different forms, from patents over genes and gene constructs, to varying forms of plant breeders' rights which may or may not allow farmers to save and reuse seeds.

8.7 SUMMARY

Natural resources vary in the degree to which they are “naturally” available versus being altered by human actions. Resource quality and quantity are heavily influenced by human behaviour and the sustainability – or lack of sustainability – of management practices. Current concerns about global climate change address some of the most basic aspects of ecosystem processes and regulation are of particular concern. Land quality is affected by degradation, or enhancement, as a function of prior use and current management patterns. Water availability is highly influenced by irrigation infrastructure and management in many regions, while water quality is affected by human actions which may lead to soil erosion and sedimentation, and pollution by agricultural, industrial and human waste. Agricultural genetic resources have been influenced by genetic selection and manipulation by both farmers and scientists over many generations.

8.8 TERMINAL QUESTIONS

- 1) What do you understand by natural resources, access and its importance?
- 2) Discuss various challenges to improve the access of natural resources.
- 3) Give an account of emerging threat in accessing natural resources.

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