

Box 1.17 Rural Poverty and Adaptation

Near a rural Bengali village, peasant families searching for firewood pick a local forest patch clean. A refugee from war-torn Rwanda flees to Tanzania where he poaches game in a national park to feed his family. A poor Kenyan family continues to cultivate their small farm plot in spite of severe erosion and exhausted soil. These are the typical images of the rural poor—people hugely dependent on ecosystems, unable to afford sound management practices, and caught in a vicious cycle of overusing already fragile and degraded resources.

A more nuanced view has emerged, however, that recognizes that the poor may have limited resources and great dependence on the environment, but they also have considerable ability to protect their ecosystems, when given the opportunity. Research is bringing to light abundant examples of *adaptation*—strategies that the poor use to lessen the impacts of environmental, economic, or social change on their resources. Adaptive measures include innovative land-use practices, the adoption of new technologies, economic diversification, and changes in social organization (Batterbury and Forsyth 1999:8).

Who Are the Poor?

Approximately 1.3 billion people, one-quarter of the world's population, live on about \$1 a day (World Bank 1999:117). In addition to encompassing insufficient financial assets, poverty often means a lack of education, mobility, employment opportunities, or access to basic services such as safe water, and physical isolation in remote villages. Limited access to land is another key aspect of poverty; 52 percent of the rural poor have landholdings too small to provide an adequate income, and 24 percent are landless (UNCHS 1996:109).

The vulnerability of the poor is often exacerbated by a lack of political power to defend their rights to environmental resources or defend themselves against outright oppression. In South and Southeast Asian countries, for example, many governments consider forest-dependent people to be squatters who are illegally using state-owned resources. They can be arbitrarily displaced, often with state sanction, no matter how long they have occupied the forest (Lynch and Talbott 1995:21). War and civil conflict in Central and Eastern Europe, Somalia, the Congo, Lebanon, and other countries have torn people from their land and plunged them into poverty.

Urban poverty is a growing phenomenon, but the largest numbers of poor people in developing countries still live in rural areas—as much as 80 percent in 1988 (Jazairy et al. 1992:1). Many struggle to subsist on lands variously described as “poverty traps,” “less favored,” or “marginal.” These tend to be areas of high ecological vulnerability (such as subtropical drylands or steep mountain slopes) or low levels of biological or resource productivity combined with high human

demands. There may be almost twice as many poor living on marginal lands as on favored lands in developing countries—630 million compared to 325 million (CGIAR et al. 1997). If current trends in poverty and natural resource degradation persist, by 2020 more than 800 million people could be living on less favored lands, places like the upper watersheds of the Andes and the Himalayas, the East African highlands, and the Sahel (Hazell and Garrett 1996).

Protecting Their Ecosystems

It is increasingly evident that the poor can fight back against environmental degradation. In some places, they have been fighting back for centuries, using adaptive measures whenever ecosystem changes have demanded them.

One example of adaptation can be found in the highlands of Papua New Guinea, where the Wola people grow crops on slopes cleared of native forests by means of slash and burn techniques. Instead of accelerating soil exhaustion and furthering deforestation, as traditional models would predict, the Wola have maintained soil fertility by constructing mounds of soil using rotting vegetation as compost. They select strategically what crops to plant, using a variety of crops in the first years of cultivation when soils are rich. In later years when soil fertility declines, the Wola plant only sweet potatoes, a crop that can thrive without many nutrients (Batterbury and Forsyth 1999:8, citing Sillitoe 1998 and Sillitoe 1996).

The Mossi people in Burkina Faso offer other examples of successful adaptation. As rapid population growth and frequent droughts have degraded their soils, Mossi farmers have responded by creating compost pits and building *diguettes*—semipermeable lines of stone placed at right angles to the slope to prevent erosion (Batterbury and Forsyth 1999:9–10). The significant number of Mossi who have migrated to cities or the neighboring country of Cote d'Ivoire for wage employment during the dry season is also an adaptive response that reduces pressures on the land and food supply, provides remittances for families, and diversifies income sources. Like all adaptations, however, these local strategies have their limitations. Severe drought or a shortage of nonfarm job opportunities can undermine the Mossi's successes.

A third adaptation example comes from the forest-savanna zone of Guinea in West Africa. For 200 years, researchers erroneously blamed the Kissi and Kuranko people for the deforestation of a large forest in the Kissidougou province. Research into historical land-cover patterns eventually revealed that the Kissi and Kuranko had actually *created* patches of forest on relatively treeless savannas through targeted burning to reduce the risk of fire and to increase soil fertility, and by tethering animals and promoting fast-growing tree species (Batterbury and Forsyth 1999:10–11, citing Fairhead and Leach 1996).

Examples of Indigenous Soil and Water Conservation Techniques in Selected West African Countries

| Country | Rainfall (mm) | Population Density (per km ²) | Indigenous Soil and Water Conservation Techniques |
|--------------|---------------------|---|--|
| Burkina Faso | 1,000–1,100 | 35 | Stone bunds in slopes network of earth bunds and drainage channels in lowlands |
| | 1,000 | 35–80 | Contour stone bunds on slopes, drainage channels |
| | 400–700 | 29 | Stone lines, stone terraces, planting pits |
| Cameroon | 800–1,100 | 80–250 | Bench terraces (0.5–3 m high), stone bunds |
| Cape Verde | 400–1,200 (uplands) | >100 | Dry stone terraces (walls 1–2 m high), rectangular basins (approx. 2 m x 4 m) |
| Chad | 250–650 | 5–6 | Water harvesting in drier regions: various earth bunding systems with upslope wingwalls and catchment area |
| Niger | 300–500 | | Stone lines, planting pits |
| Nigeria | 1,000–1,500 | 110–450 | Stepped, level benched stone terraces, rectangular ridges, mound cultivation |
| Mali | 400 | 20–30 | Pitting systems |
| | 500–650 | 13–85 | Cone shaped mounds, planting holes, terraces square basins, stone lines, bunds or low walls |
| Sierra Leone | 2,000–2,500 | 38 | Sticks and stone bunding on fields and drainage techniques in gullies |
| Togo | 1,400 | 80 | Bench terraces and contour bunds, (rectangular) mound cultivation |

Source: IFAD 2000.

Adaptation is not confined to rural areas. In cities the poor supplement their diets and income by transforming vacant lots, rooftops, and the lands along roadsides and other rights-of-way into highly productive plots of vegetables, fruits, and trees. As food and fuel are the largest household expenses for low-income urban populations, urban agriculture can be a first line of defense against hunger and malnutrition. Shantytown dwellers who mobilize to secure access to water and sanitation and improve their environments are engaging in another form of adaptation. But adaptation can be more difficult in cities, where a community's response may be more dependent on access to and support from local and state governments, corporations, or international agencies. In addition, many environmental risks are relatively new or beyond the experience of the urban poor, or difficult to detect, such as solvent or lead poisoning (Forsyth and Leach 1998:26).

How a community adapts to ecosystem decline depends on the knowledge that individuals have and the local biophysical environment, such as rainfall and soil conditions. Economic and political factors such as the availability of labor and access to markets also are crucial.

Governments, NGOs, and development agencies can help the poor respond positively to natural resource management challenges by working with local residents—supporting locally designed adaptations and community-based institutions, creating employment opportunities, and providing new knowledge, technical and marketing assistance, training, and

credit. Those institutions also can hinder adaptations and progress against poverty. Limiting the voice of the poor in resource management decisions or denying local people security of tenure and rights of access to resources are among the most detrimental factors. Without recognition of traditional tenure rights and grants of control over resources, the poor have less incentive and capacity to adapt.

Experiences of the people of Sukhomajri, India, illustrate the difference that stable tenure systems can make in the health of an ecosystem. Twenty years ago, the forest department granted villagers the right to harvest the grass in the watershed for a nominal fee, rather than auctioning the grass to a contractor who, in turn, would charge the villagers high rates for the grass (Agarwal and Narain 1999:16). With the assurance that they would reap the benefits of increased biomass production, villagers identified ways to protect the watershed—regulating livestock grazing, investing in the construction of water tanks for increased crop production, and sustainably harvesting wood from the forest that lies within the catchment. By the mid-1980s, Sukhomajri was no longer importing food but exporting it. Between 1979 and 1984, household income increased from Rs 10,000 to Rs 15,000. The village also earns about Rs 350,000 annually from the sale of milk, and another Rs 100,000 from the sale of *bhabhar*—a fibrous grass that can be used as fodder and sold to paper mills (Agarwal and Narain 1999:16). The result—a once degraded watershed is today a wetter, greener, more productive and prosperous area.