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IUCN Social Policy Group

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UNFPA is the lead United Nations organization for the follow-up and implementation of the Programme of Action of the International Conference on Population and Development, and recognizes that all human rights, including the right to development, are universal, indivisible, interdependent and interrelated.
Issues in Social Policy

OUR PEOPLE,
OUR RESOURCES

supporting rural communities in participatory action research on population dynamics and the local environment

written by Thomas Barton, Grazia Borrini-Feyerabend, Alex de Sherbinin and Patrizio Warren

with contributions from IUCN staff, members and partners

IUCN – The World Conservation Union
1997
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Acronyms

BSP – Biodiversity Support Programme
CARE – Cooperative for Assistance and Relief Everywhere
FAO – Food and Agriculture Organization of the United Nations
ICHM – Instituto Superiore di Sanità
IIED – International Institute for Environment and Development
IRC – International Water and Sanitation Centre
IUCN – The World Conservation Union
NTFPs – Non-timber forest products
OECD – Organisation for Economic Cooperation and Development
PACODET – Pallisa Community Development Trust
PAR – Participatory action research
PEC – Primary environmental care
PRA – Participatory rural appraisal
PRB – Population Reference Bureau
UNEP – United Nations Environment Programme
UNFPA – United Nations Population Fund
UNICEF – United Nations Children’s Fund
USAID – United States Agency for International Development
WHO – World Health Organization
WWF – World Wide Fund For Nature
Acknowledgments

The publication of this handbook brings to fruition a three-year process that has seen contributions from IUCN staff, members and partners in over twenty countries, as well as from rural people around the world who have generously shared their experiences with the authors. The process began in 1994, when a manuscript produced by the Social Policy Group was sent to several field-based professionals with expertise in participatory methods and 'population and environment' issues. The comments and contributions received from these professionals were incorporated into a new manuscript, which was then translated into three languages and sent out for comments to a much larger list of potential users all over the world. Their comments have also been incorporated in the present version.

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The present handbook is the result of a long process and involves numerous contributions and insights. It aims to stimulate thinking and questioning, rather than providing rigid guidelines, and it is offered as a tool for 'learning by doing'. In view of these characteristics, we hope that field-based population and conservation professionals will actually use this document in their daily work. Ultimately, it is the authors' sincere hope that Our People, Our Resources will support decisions and actions on population and environment matters in rural communities throughout the world — where those decisions and actions truly belong.

Thomas Barton, Grazia Borrini-Feyerabend, Alex de Sherbinin and Patrizio Warren
September 1997
A reader's guide to Our People, Our Resources

This handbook
• focuses on the reciprocal influences of population dynamics and the local environment: i.e., on how population size, structure, growth (or decline), and movement are related to the quality of the local environment, and to the local development process and quality of life;

• illustrates concepts, methods and tools, for ‘primary environmental care’ at the interface of population dynamics and natural resource management;

• emphasizes local knowledge and skills, local management of natural resources and participatory planning as conditions that foster responsibility for both population and the environment;

• describes a participatory action research (PAR) process in an imaginary village to illustrate PAR methods and the three core concepts of primary environmental care: meeting needs, protecting the environment, and empowering communities.

This handbook is for
• natural resource managers and conservation professionals who seek to incorporate population dynamics and participatory approaches in their work;

• health and population professionals who seek to incorporate natural resource management and participatory approaches in their work;

• facilitators of participatory action research exercises in rural communities in the developing world;

• people, professionals and project staff concerned with primary environmental care and sustainable development in rural areas.

This handbook is not
• a blueprint guide: the methods outlined provide useful ideas for those wishing to conduct PAR with a community, but they will need to be adapted to fit the unique opportunities and constraints of the local setting. Learning from experience, being sensitive to people’s needs and expectations, and being innovative, creative and critical are much more important than following the exact methods prescribed in this handbook.

• comprehensive: this handbook presents some PAR methods that are particularly useful for dealing with integrated issues of population and the environment, but the array of tools and methods for participatory action extends well beyond those discussed here. Further recommended reading in PAR and primary environmental care is listed in the reference section of this handbook.
What you can find in the handbook

- **Chapter 1** describes the interactive nature of population, environment and development and the primary environmental care (PEC) approach. The initial steps of a real PEC initiative in a rural context in Uganda are illustrated.

- **Chapter 2** presents concepts related to population dynamics and the environment and introduces key terms and indicators.

- **Chapter 3** discusses issues of participation in development and describes general features, methods and techniques of PAR. It also presents some conditions for success, and addresses the validity of PAR findings.

- **Chapter 4** describes the phases of information gathering and appraisal of a comprehensive PAR on population dynamics and the environment, and introduces specific methods and tools.

- **Chapter 5** takes the reader from assessment and analysis of PAR findings to the planning of concrete initiatives by community groups and relevant partners.

- **Chapter 6** examines issues related to the implementation of activities and describes methods for ‘learning by doing’. The same PEC initiative described in Chapter 1 is revisited, four years later.

- **Annex A** provides definitions and formulas for key demographic indicators.

- **Annex B** contains a series of files that elaborate on the participatory appraisal and planning techniques presented in chapters 3-5, illustrate key steps to practise them, and list their relevant strengths and weaknesses.

- **Annex C** introduces techniques of population projection and geographic information systems and describes two low-cost software packages useful for PAR in population dynamics and the local environment: Demproj and Map Maker.

What you can skip or just skim through

- **Chapters 1 to 3**, if you are not intrigued by theory and concepts and only wish to get a sense of what can be done in a concrete setting.

- **Chapters 4 to 6 and Annex B**, if you will never assist community-based initiatives and are just interested in concepts and theory.

- **Annex A**, if you do not need detailed demographic information.

- **Annex C**, if you do not have a computer.
What the heck is PEC?

“Have you heard about that ‘primary environmental care’ or, what do they call it…. PREC?”

“PEC, they call it PEC. Yes, I’ve heard about it; it is official policy of UNICEF and endorsed by IUCN, IIED, Oxfam, other non-governmental organizations and even some aid agencies. Interesting stuff, isn’t it?”

“What do you mean, interesting – aren’t you sick of all this development jargon? And then, what’s new about it? I bet it is a way of shuffling some concepts around Primary Health Care and making it seem like a new discovery…”

“Well, the term PEC is a sort of package, and it is easier to say than ‘community-based sustainable development’ or ‘sustainable livelihood security’. The meaning is also richer than you think. It condenses some key lessons from decades of field work – stuff that you and I have discussed for years. For instance, one of the few things on which we always agreed is that caring for local environments is essential for national environments and economies.”

“What a discovery! Local is the dimension of real meaning, it is the place where activities must be carried out, where complexities, conflicts and knots come out to ruin all the nice dreams that the planners concoct in air-conditioned offices. Besides, local environmental problems are the ones that people understand. They have immediate and often severe consequences for their health, well-being and daily income.”

“So, you agree that we should help communities to do what they can to conserve their environment today, with simple means and immediate benefits?”

“Yes, but even an environmental utopian like you cannot deny that many communities do not care a bit about conservation!”

“That is because they have more pressing needs; they can’t see how to link the satisfaction of those needs with conservation. There must be ways to support them to find out, and that is what governmental agencies and NGOs should be doing!”

“Wait a minute… There are innumerable local environments in the world, and for each of them ‘conservation’ means a different thing. In my home village we need to restore the pasture, which is almost all gone. In the villages in the mountain district, they should make sure that some trees are left standing to keep the soil in place, and that the paper mill does not pollute water so much that I’ll never be able to catch a fish in the river again. But do you believe that people are willing to pay the price of conservation, to invest labor and money, to stop getting a good income from timber and to give up their jobs at the mill? I am not talking of a small price, nor of people who have a relatively sure pay-check at the end of the month, like you and me…”
"Yes, some people are willing to pay the price, but only when conservation makes sense, when in return they get something they need and value. If you think about what you have seen with your own eyes working in this area I am sure you can find heaps of examples. That 'something' may be income, food, health, jobs, cultural value, pride, recreation or whatever else they like. It should also last, not disappear at the first gust of wind or change of administration. This is the real challenge of sustainable development: finding those ingenious solutions – unique for every environment and society – that meet the needs of the people while meeting the needs of the local environment. Some people call it PEC. But it could as well be called a 'thriving human culture'."

“What are you proposing? That someone like you or me is parachuted from outside to define the local culture of this or that community?"

“Not at all, and this is another key point of PEC: a culture cannot be defined by outsiders. The residents of your village, the people living in the mountain district, the people of this community here – they should get organized, look at their resources, figure out their problems and decide what to do. But ‘experts’ with a job and a salary in development and conservation – people like you and me – should help them out.”

“You’ll never change. You will remain a dreamer all your life. What you say is obvious, but clashes against reality. I am barely recovering from my last trip to evaluate a multimillion-dollar program that went completely astray. The supposed ‘beneficiaries’ didn’t co-operate – they knew how to get the work going but didn’t lift a finger!”

“I bet your ‘beneficiaries’ were never involved in deciding about the initiative. They were expected to be grateful for something they didn’t request and in exchange forego something they cared for. Why should they have? I know of initiatives of the beloved environmental organizations we work for that put ‘participation’ as their first objective. Look at this project document, for example. The term ‘community participation’ appears at least once on every page. But when you look at the planned activities you find that people (actually only a convenient sample of them)
will be merely ‘consulted’. Not a word clarifies what methods will be used to consult them, not a word describes what local groups and institutions will be taken as project partners. Most of the budget goes for cars, uniforms and salary incentives for governmental staff and to get our ‘expert advice’ in development and conservation. The willingness may be here, but there is still a long way to go to meaningful practice…"

“One day you should clearly explain to me what you mean by ‘participation’.”

“I mean something very close to participatory democracy, i.e., a sound measure of local control over resources and the process of so-called development. The ‘participation’ likely to be most effective for environmental care is security of access to resources – security of tenure – the most powerful incentive to invest for the long term. Control means both authority and responsibility, and we know that these are best taken up by local institutions, in particular the ones that represent local residents and resource users. Governments don’t need to let go of their rights. There are a plethora of regulations, leases, joint management agreements, rights of resource extraction and so on that can maintain governmental supervision but also create a sense of security and responsibility for the people.”

“I’ll be damned, you got me interested. So what is this PEC exactly then?”

“One definition is here, in this booklet dated 1990, look: ‘Primary environmental care is a process by which local communities organize themselves and strengthen, enrich and apply their means and capacities for the care of their environment while simultaneously satisfying their needs’.”

“(…What?)

“Imagine a little monster with three legs. One is ‘protecting the environment’, the other is ‘meeting people’s needs’ and the third is ‘empowering the community’. This is what PEC is all about. Integrating these three objectives, tapping the willingness and ingenuity of the people themselves. Of course, a variety of obstacles need to be overcome, and some conditions need to be present. That is where external support can be crucial. Political conditions include freedom to organize, capacity of influencing decisions about ‘development’, access to information, transparency about who controls what and so on. People like you and me may not always be able to help about those, but we can support on the matter of technical conditions, we can recognize that communities have valid claims of knowledge and skills, we can provide our ‘expert advice’ on the basis of a dialogue with them, building upon and integrating what already exists. I am sure you have heard about participatory approaches to research, assessment, planning and evaluation. We can encourage governments to adopt those approaches and to decentralize services, to respond to felt needs rather than try to command and control from above, and…”

“Slow down, please! Perhaps I am a bit old-fashioned, but I still believe that what really counts is the economy…”

“You are absolutely right. Some key economic conditions must be there for PEC to work. The costs and benefits of conservation ought to be allocated fairly, and communities should have access to financial means – such as loans they could obtain using as collateral the natural resources they have effectively safeguarded. They should have access to regulated markets – markets that use incentives and disincentives to value environmental care, public health and the local culture – and to reliable information regarding the conditions of such markets…”
"Sure, wait for that! And then, would that be enough?"

"No, people should have time to discuss what they want and can do, to manage conflicts (which are always there), to organize among themselves and to develop specific agreements and ‘contracts’ in partnership with other social actors. No more quick and dirty projects!"

"You have not yet mentioned one of your favorite development subjects: women!"

"Yes, and I am at fault, because women are central to PEC. They are in practice the environmental managers of most rural communities in the world, yet they are too often excluded from decisions about allocation and use of resources, and deprived of the benefits of their own labor. If PEC will succeed it will be because women will be fully empowered for themselves, their families and their communities. And a crucial component of that empowerment is their capacity to control their own fertility."

"Fertility? What the heck has fertility to do with development and the environment?"

"Nobody can deny that fertility – stuff like the total number of children a woman has in her lifetime, birth spacing and the like – has a tremendous influence on the health of women and children. And also, when fertility can be controlled, families and communities are more in control of their own destiny."

"Give me a break! This is the kind of rhetoric I would expect from a nurse at a health clinic…”

"Well, first of all there is not yet a good clinic around here, and people must walk for more than two hours to reach the closest reproductive health services. You also know as well as I do that every plot of land in this community that can be cultivated is already under the plough. The elders have been complaining for some years that the fallow is getting too short and the soil is losing fertility. Have you noticed how many young men have already left for the capital? All this would not need to happen if the population here could remain stable – let us say, at the level that it was ten years ago. I bet if the people would have a choice, they would choose not to migrate – they would stay on their land, have smaller and healthier families, remain where their forefathers lived for generations."

"My dear friend, all this is lovely in theory. But you have not yet given me a hint on how we make it a reality."

"That is what practitioners in public health, conservation, development and the whole bag of good intentions in the world are discussing to the point of losing their voices. But, if there is one thing we need to agree on, it is that the ‘beneficiaries’ should sit in the driver’s seat, and that the time of pre-cooked, expert recipes is gone forever! The people who live with the resources, the women who bear the children, the families who suffer the poverty – they should define the problems, the goals and the ways to reach them. Professionals like us can only help and support, which is what I have decided to do. I know you are skeptical about tools and bags of tricks, but there are some processes, some methods, some ideas that I am beginning to use in my work. Some people call it ‘participatory action research’ but the name, as for PEC, is not at all important. What counts is how you interact with people, and whether and how you manage to be of some help. Have you seen this manual, what is it called…yes, Our People, Our Resources. It contains some theory and some practical information on participatory action research for population and the environment. Why don’t you give it a look? You might even discover some of those hints you are looking for…”
1. Our people, our resources
The dynamics of population and the management of environmental resources are closely related concerns confronting our contemporary world. Whether we live in rural or urban, developing or developed regions, we need to understand and deal with the linkages between the status of society (e.g., population, socio-economic development, physical health, quality of life) and the condition of the natural environment (e.g., status and future prospects of fresh water, soil, forests, wildlife, biodiversity). This chapter introduces these linkages and an integrated and participatory approach for addressing them: primary environmental care. The approach is briefly described and illustrated by an example of a real case where it was put into practice.

1.1 The interactive relationship of population, environment and development
Population dynamics, quality of life and the environment

1.2 Community at the population-environment interface: primary environmental care

1.3 Primary environmental care: a beginning in Pallisa!
Organizing and addressing priority problems
Appraising the local environment
Transects, priorities, and group work
Planning for action
Monitoring and assessing progress
1.1 The interactive relationship of population, environment and development

It is a paradox of our times that in the last decades of the twentieth century, when the world is supporting a population larger than ever before and, on average, healthier and wealthier than ever before, people are increasingly concerned about the future of humankind. The media show images of poverty, hunger, violence, and disease. Recurrent social crises reveal that development efforts do not result in a more equitable distribution of wealth, nor in an overall decrease in the numbers of poor people. Where improvements in national economic indicators have been obtained, it is often at the price of harsh environmental degradation. And population growth – the ultimate sign of the success of the human species – is seen by many as a major cause of environmental stress.

The argument for the latter view is rather straightforward. As population enlarges, there are smaller amounts per person of the relatively stable natural resources, such as water, arable land or timber. More people means more environmental exploitation and/or more poverty. Yet, population growth cannot be separated from patterns of consumption, or from the technology and social systems that people use to produce goods and services. As an illustration of this point, a growing population in a given area means, by definition, a decrease in the amount of water available per person. But the impact of reductions in the per capita availability of water on food production and human health depends very much on the technology used locally for irrigation, water supply and waste disposal.

Under an unchanging technology for water and waste management, a growing population will mean a smaller production of food per capita, and the water available for drinking and hygiene may become less and less healthy due to increasing contamination by human wastes. If, however, the technology is improved to enable more efficient irrigation, water supply and waste treatment, and if the local political, economic and institutional context is such that these benefits can reach every inhabitant of the area, the overall quality of life may actually improve as the water per capita declines.

Some authors would even maintain that a certain concentration of people is necessary to provide the stimulus and economic conditions needed for technical improvement and development in general. An intriguing argument presented by Esther Boserup (1981) sees population growth as a main stimulus towards technological progress. According to this perspective, early in human history the growing needs of numbers of people
Population growth provided the concentrations of labor and the supply of ingenuity to spur the industrial revolution and the development of modern societies. More recently, population growth provided the concentrations of labor and the supply of ingenuity to spur the industrial revolution and the development of modern societies, with their high levels of employment in the production of services.

Although improved technologies may make it possible to support a larger population, they must be constantly monitored. For example, an improvement in the efficiency of fishing techniques, which makes it possible to feed more people, can lead to overfishing, progressively resulting in less food overall. Improved farming methods may produce more food per acre, and therefore support more people, but the increased population may be too large for the available water or fuel wood, thereby overstraining another set of resources. It is not by chance that the progressive exhaustion of renewable resources (e.g., water, soil, fisheries, forested land) is a major concern of both the developing and developed worlds.

What can be done to confront these issues? Over the last decades there has been a flurry of activities. A variety of international agencies, governmental bodies and NGOs have been created for the purpose. Associations of experts, consultants and development workers, each with their own jargon and corporate rules, have been set up. Thousands of books, papers, reports and manuals have been (and are still being) written. Development and environment projects now operate even in the remotest areas of the world. Globally, huge and yet insufficient sums of money are being spent for development aid and environmental initiatives.

Have these development efforts been worthwhile? Yes, if we look at improved agricultural yields, increased gross national products, increased literacy and decreased childhood mortality. Not really, however, if we take a closer look at issues of equity and environmental sustainability. In fact, problems of social injustice and environmental degradation are the true Achilles’ heel of the ‘development’ enterprise. How did it happen? Some commonly acknowledged causes of problems include the following:
• **Little concern for the distribution of the costs and benefits of development.** Economic growth measured by increases in gross national product has little to do with the distribution of wealth within a country. Many ‘development’ initiatives end up enlarging the gap between the rich and the poor.

• **Inadequate attention to cultural differences.** Development in Africa, Asia, and Latin America is often assumed to be basically a repetition of the socio-economic history of Europe and North America.

• **Scarce consideration of environmental impact and demographic changes.** It is often assumed that natural resources are practically unlimited and that population size will spontaneously stabilize with increased income and improved education and health. Both assumptions are often untenable.

• **Top-down decision-making.** Plans, programs and projects are designed and implemented with little or no involvement of local institutions or members of the local communities.

• **Little concern for human resource development.** Costly short-term missions by international experts are often preferred to investing in the long-term training of national professionals and promotion of local expertise.

If large-scale development projects are often riddled with these kinds of problems, even efforts at community-based development have been the target of criticism. In part this is because – beyond the rhetoric of official documents – the commitment of governments and agencies to community participation is often weak and self-serving (see Box 1.1).

**Population dynamics, quality of life and the environment**

How does population dynamics fit into the picture? How does it affect not only the environment but also equity, quality of life, and respect for cultural differences?

Currently, the human population is growing most rapidly in the poorest regions of the world, where the resources for technological development are most scarce and the institutional structure is weakest. Already today, one person in five cannot get enough food to support an active working life. One quarter of the world’s people still are without safe drinking water, and many more are without proper housing and sanitation. Millions of children still die from malnutrition and preventable diseases,
Box 1.1

Some critical views on community-based development

- “by focusing on fatalism and lack of self-confidence in attempting to awaken people to their potential for self-reliance, community development tends to ignore underlying causes of poverty, such as limited access to land and the complexity of conflicting social, economic and political interests.”
- “though the rhetoric of community development asserts a grassroots approach, it often erodes into the mere promotion of government projects centrally planned by external bureaucracies.”
- “when projects genuinely emerge from the initiative of local efforts, they are generally neither integrated into, nor coordinated with, larger macro-development plans and thus result in duplication and waste.”
- “community development often assumes a simple homogeneity (uniformity) of interests among village residents that is not a true reflection of the situation.”

Adapted from: Bergdall, 1993

and half a million women die each year from pregnancy-related problems. Is it reasonable to expect that vast increases in human numbers will be compatible with improvements in health and quality of life for the multitudes in need? For some it is more reasonable to expect that the weight of human population growth will end up as another burden on the shoulders of the poor and their environment (Adedeji, 1985). Thus, a world with many more people is likely to be even less equitable than it is today.

The answer to this question can be controversial, especially for rural areas. At times, increased survival rates due to improved health services and people’s behavioral change are even associated with a poorer quality of life (see Case Example 1.1).

High rates of population growth, which are common in the developing world, are largely the result of falling death rates in a context of persistently high fertility. Although infant and child mortality rates are still higher than in the developed world, there has been an overall trend toward a decrease in mortality in the early years of life and an increase in life expectancy. Yet, one may ask: “To what extent is a decrease in mortality associated with improvements in the quality of life for a community as a whole?”

And there is more to ‘quality of life’ than satisfying material needs. Cultural and biological diversity, for instance, contribute to the resilience of systems, but also make direct and indirect contributions to the quality of life (both present and future). However, both are disappearing at rapid rates due to population growth and the culture of mass consumption. Heyneman (1984) describes this process:
Case Example 1.1

Population pressure: decreased mortality versus quality of life in Ghanaian children

From 1960 to 1989, Ghana showed an impressive decrease in the mortality rate for children under five years of age – down from 224 to 123 children dying out of every 1,000 children living at the time of birth. At the beginning of the 1990s, the same trend was observed in Bongo district, a severely drought-prone rural area with little arable land and a population density of 110 persons per square kilometer. Local statistics showed that improved survival of children caused Bongo’s population to increase at an annual rate of 3 percent. In the same time period, however, the prevalence of malnutrition in pre-school children increased at an annual rate of 7 percent. Possibly, the increased population size had put so much pressure on natural resources that there was a worsening of nutritional status. Or, also possibly, a new pattern of production (e.g., cash cropping controlled by men) had reduced the control of women over land and food production for the household. In all cases, the quality of life had actually declined for those children whose survival had been improved through health-care technology and mothers’ education.

Data from: UNICEF, 1992

The essence of pre-industrial, indigenous societies is in their variety and local adaptation. Each is tied to a specific habitat, and has evolved its cultural and behavioral expression. The wide variety of resulting human social forms is a response to an equal variety of habitats, each with a set of distinctive environmental constraints. In almost diametrical opposition, industrial technological development is characterized by a controlled, relatively uniform and highly simplified environment. High levels of environmental pauperization and widely distributed homogenization characterize industrial societies in all political and economic systems throughout the world.

Thus, some fear that increased numbers of people could be sustained only by technological might and pervasive socio-cultural change, all at the expense of patiently crafted cultural peculiarities. For centuries, local cultures evolved through slow and unique combinations of resistance and adaptation to their environments. Today these cultures are simultaneously facing the dual impacts of pervasive socio-economic change and rapid degradation in ecological conditions. The indicators of ‘quantitative’ health and welfare – e.g., a decline in mortality rate and an increased national product per capita – tell us little about quality of life, a phenomenon involving culturally relative perceptions of well-being, independence, productivity, social involvement and meaning of existence.

At the global level, population growth in combination with the spreading culture of mass consumption is having major, at times devastating, impacts on the environment and natural resources. But population dynamics also encompasses other forms of population change, including population decline, migration, urbanization (or population distribution)
gender balance reflects socio-economic processes, such as male out-migration, which can have significant indirect impacts on the environment

and trends in aging and gender balance. Each of these, in turn, can have significant implications for the environment as well as for equity and the respect of cultural differences. For instance, migration from resource-poor areas to frontier regions has occurred throughout history. While such migration can reduce the environmental pressure in the source areas, the destination areas often suffer from the uncontrolled exploitation of resources, and may also experience cultural conflicts (see Case Examples 2.2 and 2.3, pp. 35-36). Furthermore, in a world of six billion people, there simply aren’t as many frontiers as in the past, and those that remain are often quickly spoiled.

Migration to cities (urbanization) may be beneficial to the environment on some levels, and harmful on others. On the benefits side, the concentration of people means that it is more efficient to provide services such as electricity, sanitation and public transportation. Furthermore, the housing concentration of urban areas, particularly those in the developing world, means that proportionally less land is taken away from agricultural activities. On the problems side, we could count the concentrated production of organic and human waste which, in the absence of modern sanitation systems, is not easily absorbed by the environment. Urban areas are also characterized by higher per capita levels of resource consumption.

At first glance, population aging and gender balance may seem to have less dramatic consequences on the environment. And yet, these too are important. Aging, especially in the developed world, is coming at a tremendous cost to social support mechanisms and the health-care system. As life expectancy climbs into the 70s in some developing countries, available public sector financial resources may be stretched to meet the growing demands on the health-care and social security systems. This may mean that fewer resources are available to meet other needs, such as environmental management and basic welfare. Gender balance reflects socio-economic processes, such as male out-migration, which can have significant indirect impacts on the environment. Where women are the heads of household, and perhaps the sole providers for a family, they may not have the time and resources available to manage the local environment in a careful and sustainable way.

Affecting demographic phenomena is neither easy nor rapid. Let us consider a reduction in natural increase (this is the portion of population growth that includes births minus deaths, but does not include
Today, up to half the population in poor countries is under 14 years of age. Given this extremely young age distribution, even if the present and next generation only have enough children to replace themselves (approximately two births per woman), the total population size of countries will still increase dramatically. This is because the number of people of reproductive age, among whom fertility is highest, greatly outweighs the population in older age groups, among whom mortality is highest. The result is a significant excess of births over deaths, leading to rapid population growth. For instance, it is estimated that the African continent, which contains 12 percent of the world’s population, will contribute about 34 percent of global population growth between now and the year 2050 (United Nations, 1995).

Given the complex interplay of population, development and environment mentioned above, is there any ‘solution’ we can pursue? Is there any way to improve the quality of human life while maintaining the quality of the natural environment? Surely there is no one solution applicable to all contexts and societies. The complexity of the issues at stake is such that even initiatives taken with the best intentions and adequate resources can end up in abysmal failures. Yet, there are some lessons from the past that can be brought to bear when searching for the specific solution to fit a specific problem and context. Among these, we know that:

- People can take care of their environment when the conditions are in place for them to meet their present needs by doing so, and to feel secure about continuing to meet their needs in the future.
- People can take care of their environment when they agree on what their problems and opportunities are, and organize to meet them together (e.g., in local groups and institutions).
- People can take care of their environment when they manage to obtain the support they need (e.g., information, technology, credit, market outlets, health care) from various partners in society (e.g., government, NGO, business, research institutions).
- People can take care of their environment when their demographic profile is not stressed beyond their capacity to cope (e.g., because of massive inflow of migrants, outflow of local workforce, too rapid natural growth, etc.).

As a way of synthesizing these lessons, some use an approach called ‘primary environmental care’.
Box 1.2

Population and ‘de-responsibilization’

Based on several case studies commissioned in rural parts of Pakistan, researchers at the Sustainable Development Policy Institute came to the conclusion that, although the population of Pakistan is reaching alarming levels and is still growing at about three percent a year, population growth is not perceived as a major issue at the village level. In other words, population growth is seen as a problem at the global or national levels, but not at the local level. This is not because of a lack of education about national priorities, but because of a conflict between national and local goals.

In some cases labor out-migration has become so important that the local environment is no longer the central source of local income. In other cases, the village environment, with the commercialization of its products, has become part of the larger economy, to such an extent that the way it is managed responds more to external constraints than to village-based requirements. The consequence is that both resource management and fertility decisions are subject to the way the community interacts with the larger politico-economic framework. But this interaction, instead of leading to a nation-wide coherence in behavior, has been the source of even more conflicts between local and national goals.

Although population growth is a problem largely at the global or national level, there are no institutions at those levels that can influence behavior to respond to this problem. In Pakistan, the authors found that the existing institutional structure has created a local-level indifference and even hostility to national problems. At the local level, too, strategies available to individuals and communities only operate at higher levels of aggregation that require co-operation. Local mechanisms for collective decision-making are either non-existent, or have been excluded from all but a few narrow areas. This includes not only the growing erosion of local government systems, but also of many institutions of civil society – the family, the neighborhood, and cultural and religious associations.

In the end, development in Pakistan has led to a ‘de-responsibilization’ of the people towards public matters. The question is not only of the power of the state, nor of the efficiency of the market, but of the general ability of institutions to help people live together and co-operate with each other. Simply put, it is a problem of governance. There needs to be a greater clarity of who is responsible for what: what are the state, local bodies, communities and individuals responsible for, and how can these different spheres of responsibility be kept mutually consistent during the development process?

It follows, therefore, that the solutions to the problem of population growth lie mostly in responsibilization of local communities, and developing patterns of governance that support efforts in local participation. One prescription is to re-create local social responsibility through the strengthening and creation of local social and political institutions, at levels at which common issues can become public matter.

*Adapted from: Banuri and Amalric, 1992*
1.2 Community at the population-environment interface: primary environmental care

‘Primary environmental care’ is an approach to community-based sustainable development matured on the basis of field experience. Many people and organizations – from both developing and industrialized countries – contributed to the development of this approach. Most of them worked in participatory projects in poor urban and rural areas. Others were involved in Primary Health Care, and water and sanitation programs. Others were employed in large- and small-scale integrated rural development schemes. Still others were simply concerned about improving their own quality of life – and the quality of life of their communities – by making optimal use of scarce resources. The knowledge and skills these people acquired from their practice with methods and tools, their tribulations with conflicts and failures and their excitement as they solved problems and helped people, all contributed to a consensus on goals to strive for, and ways to approach them. To give visibility, legitimacy, incentive and impetus to such a consensus, a name package was found: primary environmental care (PEC).

The objectives of PEC are not new, but the approach has the merit of integrating them, affirming that the management of local environments becomes effective and sustainable when linked with the satisfaction of the needs (income, food, health, etc.) of local communities, and when all the concerned people are involved and empowered to participate.

‘Meeting local needs’ means that people can maintain, produce or gain access to the goods and services (food, shelter, income, health care, education, transportation, etc.) necessary for their life, health and well-being.

‘Protecting the local environment’ means different activities under different conditions (e.g., eliminating a fire hazard, cleaning and protecting a watershed, preventing flooding, halting an unsustainable extraction of timber from a local forest, improving tilling practices to protect topsoil, restoring a degraded communal building, leaving undisturbed the habitat of wildlife, etc.).

‘Empowering local communities’ means that communities, groups and individuals obtain greater control over the factors influencing their lives. This usually goes through several stages, in which people discuss and identify their common problems and opportunities and then organize and take action in partnership with others. Securing tenure to the natural resources protected by the work of local people is a most important with security of tenure, the long-term economic interests of people tend to merge with the long-term ‘interests’ of the environment
Box 1.3

Primary environmental care (PEC)

Primary environmental care is a process by which local communities – with varying degrees of external support – organize themselves and strengthen, enrich and apply their means and capacities (know-how, technologies and practices) for the care of their environment while simultaneously satisfying their needs.

In synthesis, PEC integrates three objectives:

• meeting local needs;
• protecting the local environment; and
• empowering local communities.

The intelligence, experience, self-perceived interests and priorities of people and communities, and their willingness to work together for the common good, are what PEC is all about.

Element of the empowerment process, and essential for sustainability. With security of tenure, in fact, the long-term economic interests of people tend to merge with the long-term ‘interests’ of the environment.

If a community engages in primary environmental care, many sensitive issues are bound to be encountered, and many conflicts between local and non-local interests and opinions are likely to emerge. Such conflicts can arise in the planning stages (e.g., when trade-offs must be set among environmental, economic and social goals, and priorities for action must be agreed upon) or during implementation of activities, when some can try to take advantage of others, or problems and mistakes become apparent.

The ‘community’ may also be united and well defined only in theory. Community members may not feel a sense of common identity, may not be equally aware or concerned about problems and ready to commit resources or may not manage to achieve any suitable agreement about what to do. A lengthy process of conflict management and negotiation may be necessary before PEC activities can take off. In fact, major differences, contrasts and power imbalances are common among community members and subgroups. Women, ethnic minorities or religious minorities may not be allowed to participate in decision-making or in common endeavors on the same conditions as others. In such cases, PEC requires a significant change in local habits and departure from cultural norms.

Local empowerment can only be based on the concerns of community members and their willingness to be involved. Certainly, it cannot be ‘brought in’ from outside. From outside, however, it can be impeded. In
this sense, PEC needs to be politically feasible, a condition too often
difficult to meet. Other constraints to PEC may be lack of capital, infor-
mation, expertise, or the capacity of local people to organize, to manage
finances or to deal with government officials. Supporting institutions
(governmental and non-governmental, national and international, profit-
oriented and solidarity-oriented) can help communities overcome these
constraints.

Thus, what are the challenges of PEC?

- The first challenge is political: assuring people a fair amount of self-
determination and control over local resources.
- The second is institutional: developing local institutions capable of
gathering local knowledge and skills and delivering good ideas and
honest practice.
- The third is socio-economic: assuring social appreciation and fair
economic returns to sound environmental practice.
- Last but not least, there is a challenge of intelligence and ingenuity:
identifying the ‘win-win’ solutions by which both the environment
and people can profit.

If the process of PEC is complex and difficult, its rewards are certainly
worthwhile. People who organize and take initiatives for common
interests develop a sense of solidarity and common identity, learn how to
establish and follow their own rules, learn how to pull together resources
and overcome problems. In the process, they create new employment
opportunities, mobilize individuals and resources that were idle and
underexploited, and liberate their own energy to work, innovate and
diversify the basis of their livelihood. It is the experience of many com-
unities that such initiatives can take off with capital investments that
are relatively low. When those initiatives benefit, at the same time, both
the environment and the people, the sense of community responsibility
for the environment grows and puts down strong roots.

Box 1.4 lists some conditions for the success of PEC, and the next
section gives a case example of the first steps of a real PEC initiative in
a rural context in Uganda.
Box 1.4

Conditions for success in primary environmental care

1. **Capacity to organize and participate.** All community members need to be able to play a role in decision-making that affects livelihoods, in particular decisions over access, control and management of common resources. This implies the right to set up community gatherings and organizations. Women must be able to participate fully in these processes and capitalize on their role as environmental managers for the benefit of themselves, their households and the whole community.

2. **Capacity to influence development priorities.** Development programs need to be oriented according to the priorities felt and expressed by communities, in full partnership with the national authorities and the aid agency that may be assisting in the process. As a result, the entry point for external assistance for environmental programs may not always be an environmental priority but a community need, such as employment, housing or health care.

3. **Integration of local knowledge and awareness of the environment.** Communities need to be involved in the assembly and analysis of environmental data. The provision of external environmental information and advice should be based on a dialogue with the community. Building on and integrating traditional knowledge and skills is essential.

4. **Access to natural resources.** Communities need access, equitable internal distribution and security of tenure for all the natural resources necessary to their livelihood. Security of land tenure in urban and rural settings is particularly important, since only when tenure is safely secured do motivations for long-term improvements emerge.

5. **Access to financial resources.** Communities need access to loan and credit facilities that rely on record of payment rather than on collateral, which communities often lack.

6. **Access to environmentally sound technologies.** Communities need access to environmentally sound technologies. These are best developed by way of participatory research, to assure that they respond to felt needs and are adapted to local conditions, and are gender-appropriate, affordable, efficient, usable and repairable by locals. In particular, there is a strong need for environmentally sound alternatives to the 'unsound' technologies presently in use.

7. **Governmental support.** Governments are the prime and indispensable partners of communities in PEC. They need not only to allow the process of community-based environmental management to take place, but also to support it actively. To do so, a legislative framework for environmental protection, including monitoring and enforcement, and an integrated set of sectoral services that can address community needs are vital. Administrative decentralization is another very important step towards the PEC process.

8. **Access to information and public accountability.** These need to be provided in governmental policy and decision-making and in all aid-assisted activities. Community empowerment cannot be achieved in an information vacuum or without a chance for the community to evaluate and discuss responsibilities.
9. **External support.** Institutions (governmental and non-governmental) that can offer experience, expertise and skills in support of the PEC process at the community level need to be developed and strengthened. Also, a network of multi-disciplinary institutions capable of carrying out relevant research and training for PEC is needed.

10. **Appropriate time frame and adaptive planning.** A longer-term time frame compared with capital-intensive approaches is indicated. (Experience with other community-based approaches suggests 10-year programs as realistic, although benefits should occur far earlier.) Also, great flexibility in project planning by an iterative approach (‘learning’ rather than ‘blueprint’) and adequate monitoring are needed. Donors must be prepared for low initial levels of disbursement and for changes in priorities.

11. **Access to environmentally sound and socially responsive practices.** Communities need access to environmentally sound and socially responsive practices and tools, particularly in terms of:

   - participatory assessment of problems and resources;
   - effective education, training and social communication;
   - local organization, planning and management of community-based initiatives;
   - sustainable production (e.g., agroecology, agroforestry, integrated pest management, recycling schemes, renewable sources of energy, biogas plants, fish ponds, etc.);
   - participatory monitoring and evaluation.

*From: Borrini-Feyerabend, 1995*
1.3 Primary environmental care: a beginning in Pallisa!

Uganda’s Pallisa district is located 120km to the north east of Kampala in a lush, hilly area near the shores of Lake Kyoga. The district’s residents, mostly Iteso people, subsist almost entirely on small-scale agriculture, livestock, and fishing. The district was badly affected by the violence and civil war that tore the country apart and resulted in over a million dead under the rule of Idi Amin and Milton Obote. In the 1980s armed gangs of nomadic peoples from the north (the Karimojong) raided the Iteso’s cattle. After repeated attempts to get the government to intercede on their behalf, some Iteso mounted an armed uprising that lasted for several months. Peace returned to the area in 1989. It was time for the people of Pallisa district to rebuild their lives and, by organizing themselves in the Pallisa Community Development Trust (PACODET), that is precisely what some of them have been doing.

Organizing and addressing priority problems

It was early morning in January 1993 and Stanley had gathered together 13 members of PACODET’s executive committee. Over the course of the week, the same group would meet every day beneath a mango tree in Kapuwai, a village in the Pallisa district. Stanley, a thoughtful man with a quiet manner and bright eyes, was very much the leader of PACODET. Another prominent member was Lawrence, the headmaster of the local primary school, an upright, talkative man with an explosive laugh. James and Amos were teachers too, James assuming the role of scribe and Amos, with his broad smile, bringing a touch of levity to the meetings (except when discussing his own subject, which was geography).

Several of those who attended the meetings came from other villages. Vincent, a government agricultural extension agent who could discourse freely on any matter related to farming, traveled an hour by bike each way. Then there was Simeon Osire, a retired public health inspector from Kagoli. The world he saw today was profoundly different from that of his childhood, when food was plentiful, forests were large and luxuriant, and lions, leopards and giraffes roamed the countryside. There were many fewer women at these daily meetings than men, and only two attended regularly. Stanley’s wife Ann was a young and exceedingly gentle woman, while Filder, who was married to Lawrence, was more forceful and forthcoming. She had seven children, the youngest of whom, a two-month-old boy, came along to the meetings.
In addition to the local participants, the meeting included two health experts from Makerere University. John Arube-Wani had almost 20 years’ experience in hospital social work; since 1985 he had spent much of his time studying health issues in the countryside, where 90 percent of the Ugandan population resides. Dr. Tom Barton, an American physician-turned-anthropologist, arrived in Uganda in 1989; an expert on sexually transmitted diseases – a tenth of Uganda’s population is HIV positive and destined to die of AIDS – he was a technical advisor to the Child Health and Development Center at the University. Tom was a keen supporter of PACODET’s approach to primary health care and was also helping Stanley and his colleagues think about the ways in which they could tackle the district’s environmental problems.

“When we first decided to do something,” recalled Stanley, who returned to Pallisa district in 1989 having completed his studies in zoology at Makerere University, “we saw that the most pressing problem was ill-health. Malaria was rampant and too many women died in childbirth. Many of the children died too. Not a week passed without deaths in every village. Then one day an elderly woman died just down there.” He pointed towards the cart track which led to the primary school. “We decided to count the number of deaths and look at the diseases which were killing people. We knew the government wouldn’t do anything – we had to act ourselves.” So PACODET set to work and in just three years made great strides in promoting primary health care. “Now,” said Stanley, after welcoming everyone under the mango tree, “it’s time to look at other issues.”

PACODET’s history offers a good insight into the way in which a dedicated group of people can shape their own destiny. In 1986 half a dozen students born in the Kapuwai parish of Pallisa district decided to work out ways of improving their community’s standard of living. They founded the Kapuwai Students’ Progressive Association (KSPA) but, before they could start work, the armed rebellion had begun. After the disruptions, KSPA reconvened in 1989 as the Pallisa Community Development Trust (PACODET). Student associations are common in Uganda, but this one was different. Rather than remaining a social organization dedicated to parties and festivities, the members of PACODET decided that they wanted to serve the community. The students talked to the elders about the health problems in the villages and the elders said: “You tell us that something can be
done. Show us that what you say is true, and we will give you our support!"

The students called a meeting. Over a hundred people turned up and together they discussed ways in which they might improve health. Funds were obviously required, and each individual who wanted to join PACODET contributed 100 shillings (approximately US$0.50 in those days). Four hundred people attended the next meeting; before long, PACODET had raised 40,000 shillings and its work could begin. Given the high incidence of malaria in the district, one of the first things they did was to purchase chloroquine to treat the sufferers. Another major killer, especially of young children, was measles, and PACODET saw that there was an urgent need for a vaccination program. The association approached Pallisa’s district medical officer and requested that the government help train some of the villagers in basic health care. Since 1989, 40 community health workers and 15 traditional birth attendants have been trained in and around Kapuwai. The vaccination program began, and PACODET’s health workers were soon vaccinating more than 700 children a month against measles, TB, tetanus, polio, diphtheria and whooping cough.

The program has been a resounding success. Child mortality has fallen dramatically and the health of the adult population has also improved. During the past year John Arube-Wani had carried out a qualitative survey of five successful primary health projects around the country. “This is the only one which was initiated by the community itself,” he said, “and you really notice the difference. Here the villagers can discuss the concepts thoroughly; they feel in control and they know that they will continue to be successful. The other groups I’ve seen are much more fearful about their future as they’re so dependent on outside help.” The Ministry of Health has recognized PACODET’s Health Care Project as one of the best in Uganda. The Ministry, incidentally, supplied a refrigerator, vaccine carriers and bicycles, and provided training when requested to do so. However, most of the input, whether financial or technical, has always come from PACODET, whose members now pay an annual subscription of 500 shillings per household and an enrollment fee of 3,500 shillings. At the time of the January 1993 meeting, PACODET was midway through its most ambitious project to date: the construction of a health center that would eventually serve around 100,000 people.
Appraising the local environment

The human population was conspicuously healthier now to local eyes than it had been in 1989, but the same could not be said of the environment. Most of PACODET’s executive team were eager to tackle the area’s environmental problems, yet they seemed unclear about their precise nature. Tom suggested that they conduct a simple exercise which would help to clarify their thoughts, and they spent the whole of one afternoon drawing up two lists. One described all the features of the environment and aspects of their lives that they appreciated and enjoyed; the other concentrated on dislikes and grievances.

On the ‘appreciation’ list, a number of items came up quickly. The leafy environment, good soils and adequate rainfall. The wide varieties of birds and insects. The rocky hills, which provided a home for wild animals and stone with which to build. The swamps, which provided fresh water and a habitat for wildlife. Certain herbs for their medicinal qualities. Termites as a source of protein, and for the fine-particle clay useful for brick building. The large variety of trees, including bread fruit, mango, oil palm, pawpaw and flowering frangipani. Nature had been kind to the people of Pallisa district, and they knew it. And the society was friendly: in less abundant times everyone could be counted on to come together and share resources.

When it came to discussing dislikes, nature was only occasionally accused of making their lives difficult: monkeys raided crops, especially around their granitoid hideaways; termites occasionally caused crop damage; and mosaic disease had had a serious impact on cassava yields in recent years. And, of course, there was the mosquito, vector of the malaria parasite and scourge of the tropics. However, it was the human condition, and the improprieties and weaknesses of the people themselves, which dominated the group’s list of grievances. Education standards were poor because parents didn’t value or couldn’t afford to give their kids an education. Classrooms were in a bad state due to lack of money, and many people felt schooling was unnecessary, despite the fact that they themselves acknowledged that their problems often stemmed from ‘lack of knowledge’. Alcoholism was a problem, and so was contamination of water sources and poor sanitation, even though half the homes in the area now had pit latrines. Cooking stoves were inefficient and filled the houses with smoke. Women spent too much time collecting and transporting water. Domestic refuse left to rot in the open attracted
rats, and many people lacked proper storage facilities and regularly lost part of their crops to pests and decay. Some crops appeared to be succumbing to diseases and pests which had become resistant to sprays. Local children inappropriately used a pesticide on white ants, and hundreds of birds had died after eating the poisoned ants.

Indeed, nature seemed to be suffering on all fronts: for some time women had been cutting green wood (as opposed to natural die-off) to burn at home, thus damaging the local forests; the wetlands had been increasingly reclaimed for rice cultivation and so shrunken that a day of fishing was producing hardly a handful of fish; hunting and killing of animals had been so intense that even the commonest wild creatures, such as monkeys and snakes, were becoming rare. There were other familiar grudges such as you would hear in rural areas throughout the developing world: roads were poor or non-existent; there was no electricity or power; security was a problem, especially at night.

It took some time before anyone mentioned what many agreed to be the most complex and pressing problem: the rapidly rising population which was inevitably having an impact on the land. “Talk to any of the elders,” Vincent said, “and they’ll tell you that the productivity of the fields is falling. In the old days, people used to rest their land to allow it to recover. Now, they simply can’t afford to leave it lying idle and the soils are becoming exhausted.” The loss of cattle—providers of draught power, meat, milk and manure—has made matters worse. “Family planning is long overdue,” suggested Simeon. “We’re reproducing much too fast. If there’s a calamity in the future, we’ll all die off. I’ve got fifteen children and I’m beginning to realize the scale of the problem. I own thirty acres of land, which is a lot round here, but that won’t be enough to support my children when they grow up.”

Women’s status was also deemed to be a significant problem. If a couple had difficulty bearing children, or if a child died, women got the blame. In keeping with local custom, when approaching a man—say with a cup of tea, or to introduce themselves—women of all ages sank to their knees. Whenever men and women are together, the latter always behaved with exaggerated deference.

During the meetings under the mango tree in Kapuwai, the men talked with surprising candor about the failings of their own sex. “Men want to
drink every day,” said Lawrence, “even if they don’t have the money. Sometimes you see a father spending all the family money on himself, and that can lead to malnutrition of the children.” The lobola system, whereby men paid a bride-price for their wives, meant that men often regarded their wives – and most have two – as little more than a form of economic investment. Women were relatively powerless, even though, as Vincent pointed out, they were the most productive members of the community; they did most of the farm work, looked after the home, fetched water and fuel, cooked meals and took care of children and the sick. Despite this, wife-beating was a widespread problem in Pallisa district.

During the previous year a Women’s Association had been formed, and a small group of women met to discuss pertinent issues every Saturday. Half the executive committee and over two-thirds of PACODET’s dues-paying members are women, and female emancipation is one of the organization’s most significant tasks. According to Stanley, “Women are more prudent, and they think far more about the future than men. It’s very important – not just for them, but for all of us – that they assert themselves and participate fully in the development of this area.”

**Transects, priorities, and group work**

On the second evening in Kapuwai the villagers decided to go on a series of walks in the surrounding countryside. This would enable them to make a thorough assessment of the key environmental issues. The group began by walking through a patch of woodland. In the old days, commented one farmer, there used to be some fine woods here, with big trees and plenty of game. Today the only large animals to be seen were monkeys and the occasional antelope, and this particular wood had been heavily degraded by cutting – for fuel wood and building materials. Each year farmers nibbled away at its periphery. “It’ll all be gone if we carry on doing this,” explained Stanley, waving his hands at the recently ploughed furrows which ran up to a plot of burnt scrub. “But if you challenge people who do this, they’ll say: ‘How else can we make a living?’”

Then the group reached a marsh that was leading to a small lake. Over the past few years many marshy areas had been converted to rice paddy. Rice farming is certainly a good way of making money: rice grows well, keeps well and sells well. However, the conversion of marshes into paddy had caused much controversy. Elderly women have to walk much further now to find suitable wetlands in which to fish, and the catfish
habitat has been virtually eliminated in Pallisa district. And not only were the fish a good source of protein, they also ate the mosquito larvae. Now the area has many more mosquitoes than in the past.

To some members of the executive committee the walks on the second day were revelatory. In the morning the team clambered up to the rocky summit of the highest hill. From there they could see quite clearly how much their woods had shrunk. Dotted around the cultivated landscape were a few statuesque muvule trees. In the old days, said one of the more senior members of the committee, these trees were far more common.

The following morning the group of 13 attempted to introduce some order into the chaos of likes and dislikes which they had drawn up on the first day, also in the light of the subsequent walks and discussions. This was a lengthy process, occupying the best part of a day. By sunset, the group had ranked, in order of importance, the main areas of concern. At the top of the list came ‘lack of knowledge’, followed by ‘population issue’, ‘income generation’, ‘water and sanitation’, ‘energy, transportation, and housing’ and finally ‘food security’. Although the categories were broad and the problems not exhaustively defined, there was a general consensus around the items that were included – and especially around the need for greater knowledge.

That evening the PACODET committee sent word around the area that on the following afternoon there would be a large meeting, open to everyone, to discuss Pallisa’s environmental problems. Around 100 people turned up at the primary school and split into six groups. Each group had as chairperson and rapporteur two members of the PACODET committee and spent several hours discussing a topic of particular relevance for the priorities identified the day before. While one looked at the issue of pesticide use and abuse, another discussed the population issue, another the encroachment into swamps and forests, and another one the need to understand better what was happening in the area. Each group sat in a circle on the ground; Lawrence, in keeping with his role as schoolmaster, had wished to sit on a bench while chairing his small group, but others convinced him that it was better to be on the same level as the others. Afterwards, he said he was glad he had done that, as it helped to change his attitude. At the end of the group work, reports were given by the rapporteurs and then the women sang religious songs and some folk melodies.
Planning for action

On their last day in Kapuwai, John Arube-Wani and Tom Barton met with the executive team to discuss the results of the community-wide meeting the day before. It was now time to draw up a plan of action. Although there was a good deal of consensus on the problems to be addressed, the same could not be said for the actions that the group felt PACODET could or should take. There was still a good deal of confusion, not just about the nature of Pallisa’s environmental problems, but about their severity and significance. Stanley began by saying that the conservation of the swamps was a priority, as was the protection of the woodlands from further encroachment. At present, he didn’t think pesticide use was widespread enough to constitute a serious problem, though he acknowledged the need to gain more information about the extent of their use.

Everyone agreed that ‘lack of knowledge’ contributed to poor land-use practices, the mistreatment of women, the rapid population growth and many other perceived ills. A variety of income-generating activities were mooted. The idea of trying to gain an income while improving the environmental conditions was suggested; many found this appealing. Stanley and others expressed interest in fish farming as a possible alternative to growing rice in the swamps. Others mentioned setting up a grinding mill – they already had a suitable building – and the women in the committee discussed the local manufacture of mosquito nets and latrine slabs. There were some ventures, such as tree planting, which the villagers could undertake themselves at little or no cost. In fact, they had already set up a small nursery. There was talk too of setting up a vegetable garden at the primary school.

Yet again, ‘lack of knowledge’ was identified as a major problem. The villagers had no idea how to make mosquito nets, or where to get the materials; they had little experience in forestry matters, and none in fish farming. PACODET’s Plan of Action was mostly devoted to gathering information about training opportunities, funding sources and a variety of technologies, as well as about themselves and their surroundings. Over the next few months they intended to map their resources and carry out a survey of agricultural practices; they hoped to find out who was taking trees and who was encroaching the swamps. They also intended to look at a range of concerns from family planning to household hygiene, from dietary habits to the use of pesticides. It was an ambitious program and the faces of those gathered beneath the mango tree
expressed both excitement and apprehension. Time, they knew, would test their commitment, their ability and their luck.

**Monitoring and assessing progress**

Four months later the PACODET committee gathered once again in the shade of the mango tree to discuss progress towards implementing the Plan of Action. The participants in the January meeting were all there, but now they were joined by many new faces, among them several women. PACODET had become more structured in the past few months and various sub-committees had been formed to take charge of specific interests and activities; each was headed by a man and a woman. During the course of the day each committee reported on its progress.

James and Filder began by discussing family planning, the promotion of which had been virtually non-existent in this part of Uganda. Realizing that it was nearly impossible to get government services delivered locally, Filder and Ann had gone to Kampala in search of training and resources. For a few days they slogged around town, mostly on foot, visiting national and international agencies. They gathered huge amounts of information and ideas, and talked to many people. Gradually, they became more confident, not just in their dealings with officialdom but in discussing matters among themselves and with their families. Now they were working out plans to introduce a family planning program, plans which had been boosted by the recent news that Florence, one of PACODET's first health workers, was to receive midwifery training. This would undoubtedly help any family planning initiative, as would the expertise which Stanley was about to gain as a newly appointed short-term consultant to CARE-Uganda. His task was to assess family planning needs in three eastern districts, including Pallisa.

Amos was the next to speak and he presented to the gathering a small sample of the many maps which he and friends had made to illustrate the results of the health and environment surveys. The maps showing land-use patterns – swamps, forests, cultivated areas – were complemented by photographs taken by Tom Barton from the top of the rocky hill. Ann then discussed the preliminary results of the health and environment surveys, which had involved field visits, group meetings and questionnaire interviews with many families. It seemed, she said, that the immunization program was working well, that the incidence of diarrhea and other preventable diseases was low and that children were reason-
ably well nourished. However, the sub-committee was particularly concerned about the dangerous use of pesticides and PACODET planned to launch an education campaign to address this matter. The new regulation would limit the use of Dimicron pesticide, which was used for the control of insects and birds. Another measure to reduce pesticide use involved the purchase of a truck-load of disease-resistant cassava, which would be planted in a local plot and later distributed in the district. Some people had begun to use animal manure to fertilize their fields and to select seeds for their pest-resistant qualities. Finally, Vincent and Lawrence had set up a tree nursery in the school garden, and here the children would learn how to plant and tend trees.

Despite progress in these many areas, not everything was going well. Someone mentioned that monkeys had begun to steal chickens; as there was so little forest left for them to hunt in, no one was particularly surprised by this. One person complained about the increase in rats around villagers' homes, possibly due to the decrease in the number of herons preying on them. Several committee members wondered whether the widespread use of pesticides and the loss of wetlands habitat had led to the decline in herons. ‘We’re learning basic ecology the hard way,’ said Amos, ‘but we are surely learning it!’ Recognizing the importance of wetlands' ecology, Stanley had had contacts with the Ugandan office of IUCN, which had proposed a pilot community project in wetlands management as part of the new wetlands policy in Uganda. Everyone got very excited learning about this.

Outsiders might find it odd that a poor rural community organization should turn down an offer of money, yet this is precisely what PACODET did. A couple of years before the ‘PEC meetings’ in Kapuwai, PACODET had sent in an application for the financing of a diesel grinding mill to the US Agency for International Development (USAID). During their visit to Kampala, Filder and Ann had discussed the proposal with USAID officials, who offered PACODET a considerable sum of money. At first, the women were delighted, but after they had discussed the matter with the PACODET committee, everyone began to have second thoughts. For one thing, they realized that there were now several mills in the area which were operating at a loss. There were also the environmental arguments against a diesel mill, which would emit noxious gases, fill the air with dust and introduce an unappealingly noisy element into an otherwise peaceful and largely machineless setting.
The PACODET committee eventually decided to ask USAID to shift the grant from the mill project to another one which would establish a sewing and carpentry workshop. "So far we have no commitment from USAID," Filder told the committee, "but they've agreed to hold on to the money until we present more detailed plans for the workshop. Perhaps they'll help us to get the tools we need to start working." The women were eager to produce quilts, mosquito nets and clothes, and they wanted to use scraps of fabric, unwoven cotton and anything else they could find. The workshop would also become a useful meeting place for their association.

It was now late afternoon and an orange sun was sinking in the west. A group of teenagers arrived to play music under the tree. It was a warm, humid night; fireflies blinked in the darkness and the smell of wood smoke drifted over the gathering crowd. People ate, chatted and laughed a lot, still excited by the news of the day. As soon as the music started, many began to dance. Others came close to the players and sang. They sang religious songs, songs about AIDS, about past tragedies and future hopes. The people of Kapuwai had come a long way since their region was plundered by the Karimojong in the late 1980s. They had every reason to celebrate.

*The story of PACODET is abridged from Pye-Smith and Borrini-Feyerabend, 1994.*
2. Population dynamics and the local environment: concepts and issues
This chapter introduces some key terms, concepts and issues useful in understanding local phenomena in population dynamics and environmental management. Short case examples are used to illustrate some topics on population and natural resources, and a list of indicators is provided for those interested in measuring the status of populations and the environment. The content of the chapter can be used to guide the preliminary analysis of a community or region in which one expects to conduct participatory action research, and provides clues as to the kind of information to look for in existing data sets and reports. Readers wishing to proceed directly to participatory action research methodologies may skip ahead to Chapter 3. Additional details on the formulas and indicators discussed in this chapter may be found in Annex A.

2.1 Population dynamics: distribution, growth, health and well-being

Population density
Settlement patterns
Migration
Gender roles and sex distribution
Population growth and decline
Population and culture: fertility and contraception
Health status and quality of life

2.2 The local environment: natural resources, protected areas and carrying capacity for human populations

Water
Soil
Forests
Wildlife
Protected areas
Carrying capacity for human populations
2.1 Population dynamics: distribution, growth, health and well-being

Human populations are dynamic entities; the numbers and distribution of inhabitants in a given region (whether geographically or socio-politically defined) are constantly shifting due to births, deaths and migration. Regarding the total number of persons in a region, the calculation is very simple. Changes in population size are obtained by adding births and in-migrants and subtracting deaths and out-migrants in a given time period. Yet, not only changes in population size, but also the characteristics of the population can be of great significance for the local environment. Therefore, in addition to the total numbers of persons and the number of persons per unit of land, it is also useful to consider the distribution of a population in a territory with regard to various characteristics, e.g., age, gender, occupation, etc. (see Annex A for the exact definition of various indicators).

Population density
The concentration (or dispersal) of people in an area is a key indicator for assessing the relationship between a population and its territory. Commonly called the ‘population density’, this measurement is usually expressed as the number of residents per unit of land surface (e.g., persons per square kilometer).

Box 2.1

Variations in population density among hunter-gatherers

According to historical and ethnographic studies, the density of hunter-gatherer populations has ranged from an estimated 1.15 inhabitants per square kilometer for the Amerinds of pre-conquest western North America, to 0.15 inhabitants per square kilometer registered in the 1960s among the Kung Bushmen of the Kalahari Desert of Botswana in southern Africa.

This eight-fold difference between the two populations, which share a very similar technology and social organization, can only be explained by considering the diversity of their habitats. In this example, the limiting factor is water. Availability of water determines the amount and type of edible flora and fauna which can be found in an ecosystem. An extreme scarcity of surface or rainfall water in the Kalahari Desert has constrained the survival and size of Kung populations compared to the hunters of the American North-West.

From: Lee, 1968
Box. 2.2  
**Nucleated and scattered settlement patterns among peasant farmers**

Peasant households may be concentrated in large villages (nucleated settlement pattern), traveling every day from their home to their plots, or they may be dispersed in order to live near their fields (scattered settlement pattern).

As a rule of thumb, in areas where the land is fertile, where water is constantly available and where agricultural production is almost completely based on cereals and beans (for example, in the valleys of large rivers or where man-made irrigation systems have been built) a scattered settlement pattern prevails, along with a high population density. In areas where fertility of soil and/or water availability are major constraints and where small-scale agriculture is combined with cattle herding, we may expect to find a low population density with a nucleated settlement pattern.

A third combination is typical of tropical rain forest societies: a very low population density combined with a scattered and semi-nomadic settlement pattern (i.e., people moving to a new place every 5–10 years). This represents a two-fold strategy for procuring food, consisting of slash-and-burn horticulture of tubers and plantains for calories, combined with hunting, fishing and gathering for proteins and micro-nutrients.

At the local level, the density of human populations is affected by environmental constraints, as well as by technological, socio-economic and political factors. For example, hunter-gatherer populations that rely on wild food over relatively large territories are generally scattered and dispersed (see Box 2.1). In contrast, technological improvement and efficient management of domesticated plants and animals allow agricultural and pastoral communities to support higher densities of population per unit of land.

Taken by itself, however, the average density figure may be too rough an estimate to be meaningful. The calculation of population density can be refined by considering alternative denominators for the surface area that are ecologically or politically significant. For example:

- In 1977, Egypt had an overall density of 39 persons per square kilometer of its total land area; but due to the size of its deserts, this was actually about 1,276 persons per square kilometer of arable land.

- In 1992, the average density of the Shuar-Achuar population of the Morona-Santiago Province in the Ecuadorian Amazon was approximately 5.18 persons per square kilometer, but the actual density per square kilometer of legally entitled land was 18.7.

**Settlement patterns**

The way in which a population exploits and manages natural resources has major implications on its 'settlement pattern' (i.e., the way in which
Box 2.3

Seasonal movements of nomads

Ecological variables such as water availability, climate, flora and the type of animals raised (i.e., cows, horses, sheep, camels, etc.) contribute to shaping the size and density of nomadic groups (which are smaller than those of most sedentary peasant farmers), as well as the way in which they exploit their territory. Very often, herders’ movements are seasonal. For instance, in East Africa, nomads congregate during the rainy season and disperse during the dry season, while on the Euro-Asian tundra, human and animal populations congregate during the summer months and disperse in wintertime.

Anthropologists studying nomad groups have found that this annual cycle is also combined with a pluri-annual one, which allows herders to exploit in a sustainable way different areas and ecological niches of their territory. Moreover, some scholars have discovered how indigenous knowledge of the habitat helps the nomads to choose their movements based on climatic contingencies and variations (including droughts).

people live, work and, generally speaking, stay together). There are two basic types of settlement patterns:

- **sedentary** – people live permanently in a given place and continuously exploit the surrounding territory;
- **nomadic** – people move continuously over a large territory, and exploit its resources in a specific location only periodically.

A sedentary settlement pattern is typical of communities and societies that depend on agriculture for their survival (see Box 2.2). Nomadism is typical of herder populations who must constantly provide forage and water for their animals (see Box 2.3).

Pure sedentarism and nomadism are two ways of interacting with the environment that lead to opposing geographical distributions of populations. There are, however, many intermediate arrangements. For example, among the Batswana (of Botswana) rural dwellers traditionally had a tripartite arrangement. During the cold part of the year, they were at the ‘village’, in the wet season at the ‘lands’ for planting and in the dry season at the ‘cattle post’ for herding. Many, if not most, rural communities combine a certain degree of nomadism and sedentarism (see Box 2.4).

Density and settlement patterns of human populations are also determined by economic and political factors. Not all the needs of a rural community can be fulfilled locally. Tools for working the fields, weapons for hunting animals, kitchen and housekeeping implements, clothes and personal commodities, drugs and medicine, and magic and religious salvation are almost always obtained through markets or

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Box 2.4

Transhumance among Mediterranean peasant-pastoralists

Several Mediterranean and Middle Eastern rural communities combine small-scale agriculture with breeding sheep (and, to a lesser extent, cows and horses). During the summertime at least some of the men of each household leave their nucleated sedentary settlements in the lowlands to bring the herds to the highland pastures.

Known in central and southern Italy as transumanza, this mix between sedentary and nomadic lifestyle patterns often entails a double-residence situation, with a main house in a nucleated village and a second house (very often a hut) in the highland pastures.

Trading centers that allow exchange with the external world. Contemporary slash-and-burn horticulturists, hunter-gatherers, nomadic herdsmen and peasants with irrigated fields all depend, to a varying extent, on urban populations (much as urban populations also depend on these rural groups, e.g., for food, animal products, etc.).

Access to marketplaces for selling rural products and buying urban-made commodities is, in fact, a key element in determining geographical location and distribution of rural settlements. In addition, denser urban settlements attract people because they provide (or are supposed to provide) political and military safety, as well as coordination of efforts for building and maintaining infrastructures (e.g., roads, bridges, irrigation systems, etc.).

Urban/rural interdependency has been a constant feature since the earliest urban centers and states. Modern technology and services that provide education, health, credit, and technical assistance have made towns and central governments ever more important to rural life. Still, many ecological, economic, political, and social problems affecting rural communities are deeply rooted in past and current inequities in the relationship between village and town, community and state, and peasants and bureaucrats.

Migration

Migration can be a significant component of demographic change in small communities and a key factor affecting the way in which human populations relate to their environment. Immigration and emigration are not, however, usually documented routinely at the local level. Moreover, each local community is likely to have some unique migration characteristics (e.g., young men in rural southern Africa going to work in the mines; young women in West Africa going to towns for trading). For many communities, temporary or even semi-permanent migration is a key survival strategy during periods of drought, natural disaster or civil disturbance.
Based on the period of time involved, three main migration patterns can be identified:

- **permanent migration** (e.g., young adults leaving with their children to settle permanently in another location);
- **temporary migration** (e.g., men and/or women leaving for more than one year to find work and remit money to their families); and
- **seasonal migration** (e.g., active population looking for gainful employment for periods of less than one year).

In most developing countries, urbanization in the form of permanent emigration from rural areas to large cities has become a major trend, related to demographic, ecological, economic and socio-cultural changes. Southern Africa has seen rates of urban population growth that are double the overall growth of the national populations; because of wars, refugee movements and the social upheavals of apartheid, more than 40 percent of the region’s population now live in urban areas. Urbanization at these levels causes tremendous problems. Housing and other services are often unable to keep up with demand, leading to squatter settlements and unsanitary conditions. Urban and peri-urban areas strain the capacity of accessing water and fuel resources. Cities also produce huge amounts of waste, polluting the water of rivers and lakes.

In the past 20 years, various agencies have attempted to control the trend towards urbanization by launching large-scale agricultural development, watershed management and colonization projects. The principal rationale behind these projects is the concept of integrating previously under-exploited regions into the national economic system. The ‘surplus’ of rural population generated by natural growth is supposed to be redistributed among these areas (see Case Example 2.1).

The socio-economic consequences of such ruralization initiatives are controversial and politically very sensitive. **Resettlement and colonization,** for instance, can be carried out at the expense of the pre-existing communities in the new settlement areas. These communities, which frequently consist of ethnic minorities, may be greatly affected by a large inflow of immigrants, which they do not have the political power to control or discourage. Immigration may affect the natural resource base of these communities, bringing about resource scarcity and complex problems affecting rural communities are deeply rooted in past and current inequities in the relationship between village and town, community and state, and peasants and bureaucrats.
Case Example 2.1

Migration and colonization in the Peruvian montaña

The Eastern Peruvian Andes are covered by tropical rainforest. The landscape of this region, known as montaña, features abrupt mountains (reaching 2,500 meters) and deep valleys, dug out over the millennia by large rivers (e.g., the Huallaga, the Urubamba, the Madre de Diós, and their tributaries), draining towards the Amazon Basin. Until the beginning of this century, this region (surface area of 270,000 square kilometers) was almost solely inhabited by a few thousand Indians, belonging to groups such as the Aguaruna, the Machiguenga and others.

Opening roads across the highlands facilitated the migration of Highland peoples towards the montaña. Large international agribusiness companies, such as the Peruvian Corporation, established enormous estates in this area and offered jobs. The population began to increase. In 1940, the total population was already 245,645. By the 1981 census, 1,221,351 persons were settled in the montaña, representing a five-fold increase in 40 years. Natural population growth rates for the period ranged from 3.8 to 4.5 percent. Thus, the dramatic population growth was principally due to immigration, rather than natural increase.

The magnitude of this phenomenon calls for an explanation. Why were the Highland peasants moving towards the Upper Amazon Valley? Why did they choose to leave their community and to settle in an environment which for most of them is harsh and unknown?

B. Lesevic, a Peruvian demographer, suggested that such a large migration flow should be analyzed in terms of both attraction and expulsion factors. Among the former is a national policy which supports extending the ‘agricultural frontier’ and, consequently, colonization. This policy provides for construction of roads and social infrastructures, facilitates land entitlement, assists land-owners in making use of their property, and provides financial assistance (i.e., credit) to owners of middle-sized and small businesses. A side effect has been the development of a seasonal labor-market, attracting thousands of landless Highland peasants towards the montaña for short periods of time.

Among the expulsion factors, Lesevic includes: 1) unequal and unfair distribution of land in the Andes and low productivity of Highlands agriculture; 2) a higher natural increase of the Andean population than the actual chances of employment in the local agricultural labor-market; 3) incapacity of land reforms to change the patterns of Highlands agriculture; and 4) internal economic crises leading to increased unemployment in urban areas of the country.

Colonization of the montaña has been a safety-valve for Andean agricultural land ownership and productive structure. Supported by governments and international agencies, this process is, however, having severe environmental and social consequences. Deforestation, soil erosion, river pollution, conflicts with indigenous people, drug-trafficking, civil war, and urban poverty are attributable to this attempt to provide for the landless by expanding the agricultural frontier, without resolving inequities and the inefficient mode of production still prevalent in the Andes.

Adapted from: CNP-CIPA, 1984
Case Example 2.2
History, conservation and human rights:
the case of the Yanomami in the Amazon of Brazil and Venezuela

The survival of the Yanomami people and their forest environment has been increasingly endangered in Brazil, with the encroachment of gold miners into their territory, and more recently also into Venezuela. The invasion of 40,000 to 100,000 gold miners in the 1980s had serious negative impacts on the Yanomami’s health, socio-cultural fabric and natural environment. This has been possible because of insufficient protection and regulation from the governments of both countries.

Road construction and mining operations caused significant deforestation, game population displacement, soil erosion, mercury contamination and other forms of pollution in Yanomami territory. In addition, previously alien forms of social problems are becoming increasingly common, including poverty, alcoholism and prostitution. Further, epidemic diseases such as influenza, malaria and tuberculosis, introduced to the area by the miners, have had a devastating effect on the population of villages. In 1993, a violent massacre of Yanomami villagers, mostly women and children (at the hands of disgruntled miners), was reported around the world. In late November 1993, 16 more Yanomami were found dead in Venezuela, probably from mercury poisoning, a slower but equally fatal consequence of gold extraction.

Adapted from: Sponsel, 1996

cultural changes, often with disruptive effects. Ethnocide or genocide of indigenous peoples are among the potential negative outcomes of colonization and resettlement.

Gender roles and sex distribution

Women play an essential role in shaping the population outlook of a community. In addition to bearing and rearing children, they frequently take care of the sick and the elderly. Women are also the developers and custodians of a wealth of unique knowledge and skills, often closely related to the environment. Most cultures ascribe special responsibilities and roles for environmental care to women. Gathering water and fuel for household consumption is often exclusively done by women or girls. World-wide, girls and women are responsible for an important percentage of food production, and in some communities this contribution can range up to 90 percent.

Nonetheless, women’s economic contributions are too often underestimated. Development initiatives, and the attendant new technologies and increased economic power, tend to be taken over by men and may thereby worsen the role of women in society. The breakdown of traditional customs and rules (e.g., due to urbanization and shifts from an extended to a nuclear family pattern) contributes to their disadvantages. For instance, female-headed households, which generally depend on a single income-earner, are likely to be among the poorest households.
Case Example 2.3
The impact of rural migration on the environment in Burkina Faso

The Mossi Plateau, so named because it is the core area of Burkina Faso’s largest ethnic group, covers approximately half of the country’s land surface. The plateau is in the Sahelian zone, which is characterized by variable rainfall (600 to 900 mm per year), poor soils and sparse vegetation. Despite the environmental challenges of life on the plateau, it is home to the majority of Burkina Faso’s population, and densities are in excess of 45 to 75 persons per square kilometer. These densities, combined with rapidly growing populations, have led to extensification of agriculture, soil exhaustion, and over-cutting of forests for firewood. By contrast, the southern and western parts of Burkina Faso are relatively sparsely populated, and are characterized by more favorable climatic regimes. Population densities are on the order of 15-25 persons per square kilometer, rainfall is in excess of 1,100 mm, the vegetation is less degraded and soils are of higher quality.

The juxtaposition of these two zones has led in recent years to a large stream of migration from the Mossi Plateau to the south and west of the country, parts of which were only recently opened up for settlement since the eradication of river blindness in the 1980s. Many areas, however, were already populated by local ethnic groups prior to the arrival of Mossi from the central plateau. The scale of the migration was such that, in one village, the population quintupled from 1,402 to 7,955 inhabitants from 1975 to 1985, a 19 percent annual growth rate! In contrast to the largely male seasonal labor migrations of the past, these new Mossi migrations involve entire households who settle permanently in the new territory. In many receiving areas, Mossis are beginning to outnumber the local inhabitants.

This migration has had political and environmental repercussions. On the political side, the Mossi often set up parallel structures of village governance, rather than subordinate themselves to the local village head. This has created conflicts in some instances. Secondly, locals complain that the Mossi bring with them cultivation practices that are ill-suited to the local environment, and that deforestation has been exacerbated because the Mossi cut the forests for export to urban centers. Although the Mossi have set up their own administrative structures, they have not challenged the role of the local Chef des terres to assign lands for cultivation. In the migration-receiving areas, villages practice a form of community land management in which the Chef des terres allocates lands to peoples of his own ethnic group and to immigrants coming from outside. A newly arrived migrant can only gain rights to cultivate a piece of land if he has been ‘-sponsored’ by a local resident or an immigrant who has been in the village over three years.

In the face of unprecedented migration levels, this traditional form of land management may be contributing to problems of land degradation. First, because usufructuary rights represent rights to cultivate but not to the land itself, there is no incentive to make improvements to one’s land. On the contrary, farmers are encouraged to harvest as much as possible from the land while it is in the family’s possession. Secondly, the significant increase in demographic pressure on the land has led to over-exploitation and a decrease in the number of fallow years. Permitting farmers greater security of tenure may constitute an improvement. Whether or not a new form of land management would be culturally acceptable is a question that might make an interesting subject for a participatory action research process.

Adapted from: Yaro, 1995
Environmental deterioration results in dramatic increases in the workload of women, who must travel further to gather fuel wood and spend more hours in carrying water.

Women are generally omitted or relegated to minor roles in most development activities. Although women supply the majority of the labor when local projects require it, they have the least access to information, educational opportunities or participation in decision-making. This is particularly unfortunate because women, as the principal caretakers of rural families, are extremely practical. If not excluded from the process, women could contribute a degree of common sense which is too often missing in development planning (Bergdall, 1993).

A gender analysis of population can be of great use in planning or implementing programs involving the use of natural resources, since in many societies access to and control over the resources are gender-based (see Chapter 4). Basic demographic questions about population and women can help to reveal the nature of the labor force, as well as gender-based roles in the household, in the community, and in various sectors.

A key indicator of women’s status is education (see Annex A, section A.7). In fact, a strong correlation has been seen in many studies around the world between mothers’ formal education and decrease of infant and child mortality, decrease of household size, and increased acceptance of family planning and child spacing methods.

The sex ratio is an indicator of the sex distribution of the population, and it is defined as the number of men per 100 women (see Annex A, section A.2). If it is under 100, it means that there are more women than men in the population; if it is over 100, there are more men than women. When the sex ratio dips below 90, it is often an indication of very high male out-migration. In such areas, it is common to see many female-headed households.

**Population growth and decline**

The difference between the number of births and deaths occurring in a given period of time is the natural population growth. This natural increase excludes changes in a population size due to migration. For the sake of comparison, natural population growth is usually expressed as a percentage increase with respect to the population existing at the
Table 2.1
Some indicators to assess women’s status in the community

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<th>Topic</th>
<th>Indicators</th>
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<td><strong>Demographic indicators of women’s status</strong></td>
<td>• average size of family and household;</td>
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<td>• sex and age distribution of the local population;</td>
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<td></td>
<td>• average frequency of pregnancies and deliveries;</td>
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<td>• average interval between pregnancies;</td>
</tr>
<tr>
<td></td>
<td>• maternal mortality rate;</td>
</tr>
<tr>
<td></td>
<td>• abortion rate (especially induced abortions);</td>
</tr>
<tr>
<td></td>
<td>• migration rate and gender-specific migration.</td>
</tr>
<tr>
<td><strong>Other indicators of women’s status</strong></td>
<td>• average number of hours worked per day (work-load of women);</td>
</tr>
<tr>
<td></td>
<td>• role in household decision-making;</td>
</tr>
<tr>
<td></td>
<td>• percentage of women involved in community development activities;</td>
</tr>
<tr>
<td></td>
<td>• gender differences in employment rate and types of work;</td>
</tr>
<tr>
<td></td>
<td>• percentage of women members of local political or development committees;</td>
</tr>
<tr>
<td></td>
<td>• existence of gender-based segregation patterns;</td>
</tr>
<tr>
<td></td>
<td>• existence of female genital mutilation practices and percent of women affected.</td>
</tr>
</tbody>
</table>

beginning of the time period considered (see Annex A). A three percent rate of growth translates into a population doubling time (i.e., the time it would take for a population to double assuming constant rates of growth) of 23 years.

Examples of extreme population growth values currently affecting some developing countries are reported in the last two columns of Table 2.2. The table shows that for most of the selected countries, the crude birth rate is stationary or decreasing. Meanwhile, from 1960 to 1994, the crude death rates and especially the under-five mortality also decreased markedly in all of these countries. This pattern suggests that natural population growth in these regions has probably been related more to a decrease of mortality (particularly in the early years of life) than to an increase in natality and fertility. In the 1990s, this trend has reversed in some countries due to HIV/AIDS, e.g., in Uganda, where the average life expectancy from birth has now dropped into the mid-40s (PRB, 1996).

A **negative rate of population growth**, i.e., a natural decline in population size (sometimes called a ‘negative increase’), occurs when the number of deaths exceeds that of births. This category of ‘natural’ population decline is separate from changes in population numbers due to migration...
Case Example 2.4

Gold, slavery, and epidemics:
decrease of the Amerindian population after the Hispanic Conquest

The “great dying” first affected the islands of the Caribbean. It then spread to the mainland shores of the Middle and South American lowlands in general. Finally, it made inroads into the highlands, which had supported the great polities of the Aztec, Chibcha, and Inca. Hispaniola (Santo Domingo) had about a million inhabitants in 1492, when first contacted by Columbus. By the end of the 1520s only insignificant numbers survived.

A primary cause of the deaths and population decline was the spread of Old World pathogenic organisms to which the New World populations had not yet developed some immunological defenses. The impact of smallpox and measles, often complicated by respiratory ailments, was intense over wide areas. There were as many as 14 major epidemics in Mesoamerica, and perhaps as many as 17 in the Andean region between 1520 and 1600. Other illnesses had more localized effects. On the Mesoamerican coast, malaria – probably introduced by mosquitoes traveling on the ships of Spanish merchants and soldiers from Italy – caused regional havoc and then spread through the tropical lowlands.

One must ask also about the social and political conditions that permitted the pathogens to proliferate at so rapid a rate. On the islands and in the borderlands of the Caribbean, these conditions clearly included the extensive use of slave labor in the search for gold, and (after 1494) a massive intensification of slave raiding and slavery. Nicaragua alone lost, in the first half of the sixteenth century, an estimated 200,000 inhabitants to slave raiders, who sold their prey in the Caribbean islands, Panama and Peru.

Whatever the baseline figure, the combined effects of ‘new’ diseases and colonization catastrophically decimated the population. The pre-Hispanic population of Mesoamerica has been estimated at 25 million, but it fell to a low point of 1.5 million by 1650, recovering only slowly thereafter.

From: Wolf, 1982

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balanced against high fertility. Today, births and deaths tend to balance in populations with an older age distribution in which each couple averages only two children that survive to reproductive age. This kind of zero natural growth, achieved by a reduction in both mortality and fertility attained throughout the globe, would be a powerful component of sustainable livelihood.

Population and culture: fertility and contraception

High numbers of offspring are encouraged in many rural communities. In fact, most ethnic and peasant groups world-wide set a high value on fertility. Among the Akan of Ghana, for example, a woman who gives birth to ten children is rewarded with ‘the tenth-child sheep’, so that she would not stop at the seventh, eighth, or ninth child.
Table 2.2

Comparison of mortality and population growth indicators — in 12 countries with high U5MRs and above-average annual growth rates

<table>
<thead>
<tr>
<th>Country</th>
<th>Under-5 Mortality Rate*</th>
<th>Crude Death Rate</th>
<th>Crude Birth Rate</th>
<th>Annual Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high U5MR countries (over 140)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niger</td>
<td>320</td>
<td>320</td>
<td>29</td>
<td>19</td>
</tr>
<tr>
<td>Somalia</td>
<td>294</td>
<td>211</td>
<td>28</td>
<td>19</td>
</tr>
<tr>
<td>Liberia</td>
<td>288</td>
<td>217</td>
<td>25</td>
<td>14</td>
</tr>
<tr>
<td>Tanzania</td>
<td>249</td>
<td>159</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>Nigeria</td>
<td>204</td>
<td>191</td>
<td>24</td>
<td>16</td>
</tr>
<tr>
<td>Gabon</td>
<td>287</td>
<td>151</td>
<td>24</td>
<td>16</td>
</tr>
<tr>
<td>Uganda</td>
<td>218</td>
<td>185</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Pakistan</td>
<td>221</td>
<td>137</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>High U5MR countries (65 – 140)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kenya</td>
<td>202</td>
<td>90</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>209</td>
<td>68</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td>Iraq</td>
<td>171</td>
<td>71</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>181</td>
<td>81</td>
<td>20</td>
<td>12</td>
</tr>
</tbody>
</table>

* Calculated on the basis of crude birth and death rates

Source: UNICEF, 1996

or displacement. As human populations in the developing world generally tend towards increasing in size, negative rates of population growth are often the result of natural or man-made disasters (see Case Example 2.4).

Some population declines have been linked with severe environmental degradation, as for the lowland Maya of Yucatan during the ninth century AD (see Case Example 2.15). More recently, genocide (i.e., the intentional destruction of a given population, often on the basis of ethnic hatred) has caused substantial population losses. ‘Natural’ population declines have also been observed in some affluent communities in developed countries (see Case Example 2.5).

Population growth may also be equal to zero. The zero-growth situation, frequently termed ‘population stabilization’, develops when the difference between the numbers of live-births and deaths in a given period of time is equal (or nearly equal) to zero. This situation is an index of balanced population dynamics, which, in fact, is what has happened for most of mankind’s evolutionary history, with high child mortality
In settings where no social security system is available, sons and daughters are the only security a parent has in his/her old age. Moreover, beginning in childhood, sons and daughters often work to provide additional income for the household. Once grown up, they play a major role in strengthening, through marriage, the social links between their parents’ household and other members of the community. This often represents important economic and social advantages for the families involved, in terms of capacity to mobilize extra labor, exchange of goods and services, maintenance of property rights, social status, etc.

The economic and social advantages of high fertility are often embedded in deeply rooted social and religious values. With the exception of Catholicism, no major religious tradition contains an unequivocal and universally accepted prohibition against contraception. Even so, many traditional communities still rely on religion for arguments opposing the limitations on fertility and family size advocated by external development agents. For example, while religious scholars are divided on the attitudes of Islam towards contraception, the widespread belief among many practicing Muslims is that modern contraception is incompatible with religious teachings.

Until recently, only Western Europe and societies with European ancestry in the New World looked negatively on fertility. These societies are characterized by nuclear families, late marriages and parents contributing to their children’s economic well-being: all factors that would favor smaller families and lower population growth (see below, Case Example 2.5).

In contrast, the predominant family pattern in much of rural Asia and Africa is extended families, early marriages and ‘adult’ children who economically assist their parents. These factors tend to encourage high fertility and high population growth rates.

In both cases, cultural attitudes toward fertility appear based on the predominant social and economic conditions in a given community. In the long run, both cultural systems are unsustainable, because growth in either population or consumption cannot continue indefinitely into the future.
Case Example 2.5
Negative natural growth and child-rearing costs in northern and central Italy

In 1993, in the industrial and affluent areas of northern and central Italy, the balance between births and deaths was negative, i.e., approximately minus 78,000. This trend seems to be related to both economic and behavioral factors, as well as to the wide availability of family planning services.

In this setting, the desired pattern of consumption and the cost of living require a level of income which can only be achieved if both husband and wife have full-time jobs. The average number of years of education (including high school and university) delay the integration of young adults into the workforce, postponing to the third decade of life the age at which a married couple feels sufficiently self-reliant to engage in parenthood. In fact, the socio-economic cost of child-rearing has greatly increased in the last decades. As a consequence of this economic trend, fertility is no longer a way to gain social status, and parenthood is no longer perceived as a basic condition of adult life. Most married couples feel comfortable with having just one child; others completely ignore the biological and psychological drive towards reproduction and renounce parenthood.

Adapted from: Solinas, 1992

Throughout history, the high fertility of human beings has been balanced by both natural and cultural controls. Natural controls include biological determinants of natural fertility, such as women’s monthly menstrual cycles, their nutritional status, and infectious or degenerative diseases. Culture, which broadly includes clusters of shared values and behaviors, controls fertility through practices related to conception, as well as to the care of fertile and pregnant women, infants and children. Cultural controls affect population dynamics in two complementary ways:

- by determining and shaping behaviors that result in the reduction of women’s natural potential for fertility, e.g., late age of marriage and first births, prolonged breast-feeding, prolonged separation of parents after a birth, use of family planning methods, etc.
- by defining the sets of values, beliefs, and specific attitudes that influence the context of reproduction and parenting, e.g., perceptions of the best age to start parenting, stigmatizing new pregnancies that occur when the previous child is still breast-feeding, giving special names to persons who bear twins or triplets, etc.

Cultural regulation of sexual activity (coitus) is the most direct means of controlling conception. In all societies, this is achieved through rules which limit potential sexual relationships (e.g., forbidding incest). Age-at-marriage and sexual taboos preventing intercourse during specific periods (for instance, soon after the birth of a child) can be considered mechanisms for controlling sexual activity, and therefore the potential for reproduction.
A second way of controlling conception by cultural means is contraception (i.e., practices which reduce the probability of a woman becoming pregnant without necessarily preventing sexual intercourse). Contraception also includes regulating sexual activity based on scientific or folk knowledge of reproductive anatomy and variations in fertility during the menstrual cycle, as well as contraceptive herbs and medications.

An important means of controlling conception, practiced by most pre-industrial societies, is prolonged breast-feeding. Folk wisdom in many regions includes awareness of the relationship between breast-feeding and length of post-partum amenorrhea (i.e., the time following delivery during which a woman’s menstrual cycle is interrupted). Research studies have shown that under favorable conditions, prolonged breast-feeding can result in birth-spacing intervals of three or more years, with a reliability comparable to modern medical and chemical contraceptives (Short, 1984).

In addition, harsh living conditions tend to affect fertility. According to Harris and Ross (1987), the way in which women are physically treated can raise or lower the age of the first menstruation, lengthen or reduce the period of adolescent sterility, increase or decrease the frequency of amenorrhea, and hasten or retard the upper limits of the fertility age. Variation in nutritional intake, physical workload and harsh living conditions may decrease fertility and increase the risks of natural abortion, maternal mortality and infant mortality (Bongaarts, 1982; Hamilton et al., 1984).

In many rural communities, various traditional (non-medical) forms of planning and controlling births are far more prevalent than the modern methods. In fact, most individuals or couples who utilize modern methods are also likely to be using one or more of the traditional methods. Thus, measurements of the impact of family planning interventions that are only linked to levels of acceptance or use of specific modern methods may be of little value in determining actual practices that are regulating population size in a community.

Over-emphasis on modern methods can also lead to discounting traditional values in the community (Mamdani, 1972). A good method of assessing the effects of any intentional change in population control-related behaviors in a community is to measure birth intervals, i.e., the...
The assumption that a decrease in infant and child mortality would automatically lead to a reduction in the birth rate proved to be questionable...

Intra-uterine death and spontaneous abortion are high among human females, i.e., up to 25 percent of pregnancies during the first month (MacCormack, 1982). Although this pattern is partly due to natural anatomical and physiological factors, such a high abortion rate cannot be explained without taking into account the effects of harmful cultural practices. Among such behaviors are not reducing the workload of women during the early months of pregnancy or not providing them with a high-quality diet. Additionally, intentional abortions (by mechanical or chemical means) are practiced in many cultures as a child-spacing device (Devereux, 1976). The impact of these practices may reach far beyond the direct effects on the new life – unsafe abortions can cause anatomical and physiological damage that reduces a woman’s fertility.

More or less deliberate infanticide has also been widely reported in historical and anthropological literature. In addition to direct killing, at least five other forms of infanticidal behavior occur in several cultures: placing an infant in dangerous situations; abandonment with little chance of survival; negligence resulting in accidents; excessive physical punishment; and lowered biological support (Scrimshaw, 1983). Not only infants, but also children are the victims of direct or indirect forms of homicide (Dickemann, 1984; see also Case Example 2.6).

Concern over population growth is not new to the domain of public health. Since the late 1960s, when the assumption that a decrease in infant and child mortality would automatically lead to a reduction in the birth rate proved to be questionable (see Box 2.5), a family planning component has been added to most national health service delivery systems. In 1978, family planning was acknowledged by WHO as a basic element of comprehensive Primary Health Care, and some years later it was endorsed by UNICEF as a key component of its child survival strategy.

Nonetheless, in many countries – particularly those in Sub-Saharan Africa – the short-term impact of family planning programs on fertility rates has proven to be limited. Cultural acceptance, physical and financial accessibility for users, and costs of service delivery have been shown to be major constraints. Actual use of modern family planning
Case Example 2.6

Beliefs, parents' attitudes and childhood deaths among the Achuar

The Achuar (a slash-and-burn horticultural society of the Pastaza watershed in the Ecuadorian and Peruvian Amazon) consider the first year of life of a new-born baby as an extension of his or her intra-uterine existence. Infants are thus perceived as being not only completely dependent on the mother, but also as weak, incomplete and not yet full sons or daughters. Until they are given a personal name, their social existence is not even acknowledged.

Achuar infants are assumed to be exposed to a vast amount of risks posed by the magic powers of almost all objects, plus the behaviors of their parents. Most infant illnesses are believed to occur after parents breach some of the infinite eating and behavioral taboos they must respect in order to ensure an infant's health and survival. The death of a breast-fed child is most often attributed to a ritual that has not been correctly followed by the parents. Even so, no blame is given to the mother or the father of the dead baby: everybody understands that the number of taboos is so great that it would be impossible to live without breaking some of them. Thus, when infants die, limited mourning rituals are carried out in a rapid fashion. Within days, nobody in the community seems to be further interested in the issue.

This attitude is in strong contrast to the anxiety which surrounds illness in an already weaned, but walking and talking child (i.e., a being who has a personal name and who is a 'real' son or daughter). A sick child is a major event for a household: huge amounts of money and time are invested in attempts to heal the child through modern medicine or expensive shamanistic rituals. The death of such a child is often attributed to enemies' witchcraft. Long mourning rituals are performed, and the warriors of the community may discuss for weeks, or even months, the possibility of taking revenge on the witch suspected of being responsible for the death.

However, as soon as the symptoms subside and the child recovers, the daily routine of child-rearing is resumed. Weaned children are left alone for the entire day with a sister who is only two to three years older. During meals, they are not entitled to their own portion of food but must share those of the parents, kinsmen and visitors. Customary rules are enforced by threats, physical punishment and, in cases of severe infringement, administration of intoxicating datura roots. Accidents both within and outside the home are quite common, as is retaliation against small children by elder brothers and sisters.

Considering infants as not fully human and accepting their death as destiny is perhaps a way of culturally and psychologically managing the fragility and precariousness of the early months of life and the high infant mortality affecting tropical rain forest societies (more than 150 deaths per 1,000 live births). Severe and somewhat inconsistent child training may, on the other hand, be interpreted as a way of promoting acquisition of behaviors and skills which are adaptive with respect not only to the harsh physical environment with which the Achuar must deal, but also to the conflictive, violent and unsafe social arena in which adult social life unfolds. The Achuars' version of the Darwinian principle of survival of the fittest may indeed have contributed to limiting population growth over the centuries.
Box 2.5

How can the birth rate be reduced?

There is a widespread assumption that the necessary and sufficient condition for reducing the birth rate is to reduce the child death rate. The reasoning goes that if families see that their children no longer die, they will have fewer of them.

Preston (1978) was among the first to question this notion. He called it a “hopeful policy declaration resting on a thin research base” and wondered how much mortality decline can be expected to translate into fertility decline, and the strength of this relation in “setting levels of mortality control.” An additional child death in a family leads, on average, to far less than one additional birth, especially in high-fertility pre-transitional societies. He concluded: “The picture is not attractive for those who look to mortality reduction as a means to reduce fertility through familial effects, let alone those who advocate such measures as a means to reduce growth rates.”

A fall in the birthrate leading to a demographic transition seems to require the harnessing of social and economic gains consequent to poverty reduction and socio-economic development. Unfortunately, serious constraints prevent such development from happening and thus the birth rate from falling. The factors include lack of agricultural land and its poor quality and irrigation potential, poor supplies of energy and other raw materials, limited access to education and jobs, and lack of political representation. There is also the economic stranglehold exerted by the rich over the poor, and by the industrial over the developing world; the time needed for structural and cultural change must also be taken into account. For many countries, these constraints appear to be so great that a demographic transition is unlikely to occur before excessive pressure is exerted on the ecological support system.

From: King, 1990

technologies is the result of complex socio-cultural changes that sometimes unfold through generations.

Furthermore, important gender differences exist in many societies concerning the perceived advantages and disadvantages of having many children. Because women disproportionately bear the costs of childbearing and child-rearing, they are often more interested than men in limiting and spacing births. Today, there are high levels of unmet need for family planning among women in the developing world. Unmet need is a measure that represents the percentage of women of reproductive age who wish to space or limit births but who are not currently using a contraceptive method.

The Program of Action that emerged from the 1994 International Conference on Population and Development emphasized that organized family planning programs are but one component of a broader strategy to stabilize population growth rates and improve well-being. The other ingredients include improving women’s status, expanding reproductive health services, poverty alleviation, improving infant and child health
Case Example 2.7

Linking population and environment in south-west Uganda

The Kigezi region of south-western Uganda is a beautiful area characterized by heavily terraced hills that quilt the landscape. Once covered by forest that extended from Zaire to Burundi, most of the trees have been cleared for timber, building poles and arable land. Only two major remnants of the forest remain intact in Uganda, and both were designated as national parks by the government in 1992: Bwindi Impenetrable National Park (BINP) and Mgahinga Gorilla National Park (MGNP). Together, the two parks are home to over half of the world’s population of mountain gorillas (Gorilla gorilla beringei).

Beginning in 1986, NGOs have supported conservation and development activities through agro-forestry extension programs combined with conservation education and community outreach. In 1994, a more participatory, need-driven approach was adopted. The new activities include a groundbreaking multiple-use program in which certain resource users from a community are allowed access to previously restricted forest products, such as weaving materials and medicinal herbs.

In 1992, in part as a response to a desire for family planning assistance expressed by community members and relayed through project staff, one of such NGOs (CARE) initiated a region-wide family planning program. The Community Reproductive Health Project (CREHP) works with the district health teams to train clinic personnel in the delivery of family planning services in 74 regional health units. In 1994, CREHP began selecting and training community volunteers to provide family planning counseling and referral in their communities and to distribute contraceptives.

From the initial impetus for CREHP, the linkages between the two regional projects were apparent. Population densities surrounding the parks are some of the highest in Africa, exceeding 250 persons per square kilometer. Land shortage due to overpopulation is one of the most pressing problems for people of the area, as reported in numerous community surveys. Furthermore, there are serious doubts that the conservation program will be sustainable if the local population continues to grow at its current rate of about 3 percent. Finally, the desire for family planning among local populations is high, due mostly to an inability to adequately provide for current children and a pervasive lack of male support in the household.

From: Lindblade, 1994

services, education of the girl child, and increasing male responsibility. Work on all of these fronts together is likely to have a greater impact on fertility than would investment in family planning alone.

Health status and quality of life

Decreased mortality (especially among infants and children) and a related increase in life expectancy are evidence of a general improvement in the health status of human populations. This phenomenon, which is in contrast to the sometimes apocalyptic news and images of poverty, disease, malnutrition and death spread by the media, has intrigued demographers and epidemiologists and incited them to ask: “Why is mortality decreasing?”
Table 2.3
Some indicators of health status and quality of life at the local level

<table>
<thead>
<tr>
<th>Topic</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproductive health</td>
<td>• average age at marriage, by gender;</td>
</tr>
<tr>
<td></td>
<td>• average age at first and last birth;</td>
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<tr>
<td></td>
<td>• average number of deliveries in women’s reproductive life;</td>
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<tr>
<td></td>
<td>• average length of child spacing, i.e., average duration of intervals between consecutive births to the same woman;</td>
</tr>
<tr>
<td></td>
<td>• percentage of women who wish to delay childbearing or stop having children who are not currently using modern contraception (unmet need);</td>
</tr>
<tr>
<td></td>
<td>• percentage of women of reproductive age with access (walking distance, reasonable hours, manageable costs) to health care and family planning services;</td>
</tr>
<tr>
<td></td>
<td>• percentage of pregnant women without anemia;</td>
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<tr>
<td></td>
<td>• percentage of deliveries with trained attendant at the birth;</td>
</tr>
<tr>
<td></td>
<td>• percentage of pregnant women under age 25 who test negative for syphilis or HIV/AIDS infection.</td>
</tr>
<tr>
<td>Mortality and morbidity (conventional health status indicators)</td>
<td>• mortality rates (infant, child, maternal);</td>
</tr>
<tr>
<td></td>
<td>• top five causes of morbidity and mortality by age group (infants, under-5s, adolescents 10–19 and adults);</td>
</tr>
<tr>
<td></td>
<td>• rates of diarrhea or acute respiratory infection in children under 5;</td>
</tr>
<tr>
<td></td>
<td>• incidence of vaccine-preventable diseases (i.e., whooping cough, measles and poliomyelitis) in children under 5;</td>
</tr>
<tr>
<td></td>
<td>• prevalence of TB in different age groups;</td>
</tr>
<tr>
<td></td>
<td>• prevalence of malnutrition in 1–5-year-old children;</td>
</tr>
<tr>
<td></td>
<td>• prevalence of anemia in pregnant women;</td>
</tr>
<tr>
<td></td>
<td>• incidence or prevalence of endemic diseases (such as malaria, schistosomiasis, guinea worm, leishmaniasis, leprosy, etc.) in different age groups;</td>
</tr>
<tr>
<td></td>
<td>• prevalence of alcoholism and drug addiction (by age and gender);</td>
</tr>
<tr>
<td></td>
<td>• accidental death rate (by age group and gender);</td>
</tr>
<tr>
<td></td>
<td>• rates of intentional deaths by age and gender (homicide, suicide).</td>
</tr>
<tr>
<td>Sustainable natural resources use</td>
<td>• percentage of arable land exploited;</td>
</tr>
<tr>
<td></td>
<td>• percentage of land showing signs of degradation;</td>
</tr>
<tr>
<td></td>
<td>• percentage of forested area lost or regained annually;</td>
</tr>
<tr>
<td></td>
<td>• percentage of natural wetlands lost or regained annually;</td>
</tr>
<tr>
<td></td>
<td>• depth of permanent water table (time trends);</td>
</tr>
<tr>
<td></td>
<td>• number of endemic species of animals or plants that are extinct or endangered;</td>
</tr>
<tr>
<td></td>
<td>• number, extent and danger of chemicals being used locally for pest or weed control.</td>
</tr>
<tr>
<td>Topic</td>
<td>Indicators</td>
</tr>
<tr>
<td>-------</td>
<td>------------</td>
</tr>
</tbody>
</table>
| Satisfaction of some basic needs | • percentage of children with basic anthropometric (nutrition and growth) measures within accepted standard;  
• percentage of new-born babies with a birth weight within accepted standard;  
• percentage of households with access to safe water throughout entire year;  
• liters per person of safe water available/in use;  
• percentage of houses properly protected against extreme weather;  
• percentage of households with a kitchen separated from the living area;  
• percentage of households with separate bedroom for every two persons;  
• percentage of households with income above the official poverty line;  
• percentage of households with savings or access to an equitable credit system;  
• labor division by age and gender within household;  
• male and female literacy rate;  
• percentage of children 6–12 years old enrolled in school;  
• percentage of 1–2-year-old children fully immunized against vaccine-preventable diseases;  
• percentage of households living within two hours of the nearest health unit (and services provided at the unit);  
• average cost of services at nearest health unit (is it affordable by the ones most in need?);  
• percentage of adults actively participating in community decision-making, by gender. |

A study carried out by Caldwell (1989 and 1993) on a sample of 15 developing countries showed that a strong correlation exists between health success (measured in terms of mortality decrease and life expectancy increase) and the educational levels of women of maternal age, followed closely by the practice of family planning and the education of men, and to a lesser extent by the density of doctors and levels of nutrition. Per capita income seemed to have little effect.

Based on these and other similar data, Murray and Chen (1993) suggested that improvement in health status is related to two types of health promotive assets:

- physical assets, including health-care infrastructure, schools, transportation facilities, housing, water supply and sanitation; and
- social assets, including education and health-related perceptions and behaviors.
The reduction of human death rates has always been seen as an absolute good in public health, and unease about population increase has never been an accepted constraint of any public health measure. Will visions of the ultimate effects of population expansion alter this view?

Hill (1960) called it “the most solemn problem of the world” and wrote: “If ethical principles deny our right to do evil in order that good may come, are we justified in doing good when the foreseeable consequence is evil?” In other words, are there some programs which, although technically feasible, should not be initiated because of their long-term population-increasing consequences?

In Preston’s words (1978) should one deliberately “set levels of mortality control”? Is what is done corporately in public health ethically different from what is done individually? How far is it necessary to look into the future to decide between immediate and distant goals? How much should ecological sustainability influence health programs?

From: King, 1990

According to these authors, the summative effect of physical and social health assets (which have developed, to a variable extent, throughout the world in the last 20 years) should be considered as the leading cause of recent mortality decreases in the developing world.

Meanwhile, the example from Ghana (see Chapter 1, Case Example 1.1) shows that mortality and morbidity rates alone are not appropriate for describing the health status of a community. The definition of health as comprehensive well-being requires that health status be assessed not only in terms of decrease in mortality and morbidity, but also with respect to quality of life. This raises some ethical dilemmas (see Box 2.6). King has suggested re-defining health as a sustainable state of well-being. This state can be achieved and maintained by keeping both population and consumption within the limits set by the carrying capacity of local environment. Public health interventions could thus be improved by including efforts aimed at limiting both population growth and the exploitation of the natural resource-base.

In addition to considering the ethical dilemmas which population management and health promotion situations pose, as pointed out by King (1990), the conventional definitions of health are incomplete. Health equated to “absence of disease” or defined in Primary Health Care as “complete physical, mental and social well-being” (WHO, 1978) does not include one fundamental aspect: that the health of a human community is directly linked with the health of its natural and social environment.
Together with conventional ‘negative’ health status indicators such as mortality and morbidity rates, positive indicators of health (i.e., of quality of life) could thus be examined, focusing on issues such as reproductive health, sustainable use of natural resources and satisfaction of basic needs.

A non-comprehensive example of a list of indicators for assessing health status and quality of life at the local level is provided in Table 2.3.
2.2 The local environment: natural resources, protected areas and carrying capacity for human populations

This section briefly illustrates the management status of some natural resources of great importance for human populations. Ideally, sound management incorporates both preservation and sustainable use, i.e., the maintenance of viable ecosystems capable of sustaining biodiversity and providing resources for future generations, coupled with uses of such resources to satisfy today’s needs (IUCN et al., 1991).

Water

The current world supply of renewable fresh water per capita is only 60 percent of what it was in 1970 (Engelman and LeRoy, 1993). Water is becoming scarce due to growing populations, increasing demands for agricultural and industrial use and inefficient water management. At the local level, specific causes may include man-made changes in watersheds (e.g., dams, irrigation systems), changes in vegetation coverage (deforestation, erosion), increased pumping of underground water (lowering the water table), and waste in water distribution systems (including losses due to leakage).

Decreased availability of water is coupled to worsening of water quality. Excessive exploitation of surface and underground water for irrigation purposes may lead to salinization (i.e., abnormal concentration of mineral salts in the topsoil) and water logging due to poor drainage. Increased use of surface water by human and livestock populations increases the risk of biological contamination of streams, ponds and lakes (with consequences for human health). Uncontrolled industrial and agricultural use may cause chemical pollution of both underground and surface water (with potentially severe consequences on human health, fisheries and aquatic animals and plants).

A set of indicators for assessing water availability, water quality, and functioning of water supplies and distribution systems at the local level is provided in Table 2.4. This information could be useful in working with communities that are making decisions about the importance of water management initiatives, as well as in evaluating the relevant results.

Community-based initiatives for improving local water management may include:

- protection of water sources (e.g., building a cement cover and outflow pipes for a spring so that animals and people do not contaminate the source);
Table 2.4
Some indicators of water availability, water quality, and functioning of water supplies and distribution systems at the local level

<table>
<thead>
<tr>
<th>Topic</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water availability</strong></td>
<td>• percentage of households with safe domestic water sources (wells, taps, etc.);</td>
</tr>
<tr>
<td></td>
<td>• average walking time from house to source of safe drinkable water;</td>
</tr>
<tr>
<td></td>
<td>• average number of liters per capita available in the household in different seasons;</td>
</tr>
<tr>
<td></td>
<td>• hourly capacity of springs in different seasons;</td>
</tr>
<tr>
<td></td>
<td>• depth of the water table as measured in different seasons in a sample of wells;</td>
</tr>
<tr>
<td></td>
<td>• regularity of stream flow (overflow after rainfall? dry in summer? etc.);</td>
</tr>
<tr>
<td></td>
<td>• average time spent daily for watering cattle in different seasons;</td>
</tr>
<tr>
<td></td>
<td>• percentage of productive units having access to irrigation systems;</td>
</tr>
<tr>
<td></td>
<td>• surface of irrigated land plots;</td>
</tr>
<tr>
<td></td>
<td>• length of irrigation systems.</td>
</tr>
<tr>
<td><strong>Water quality</strong> (human use only)</td>
<td>• turbidity, chemical pollution, bacterial pollution;</td>
</tr>
<tr>
<td></td>
<td>• number of fecal coliforms per ml in different water sources and seasons;</td>
</tr>
<tr>
<td></td>
<td>• salt concentration per ml in different water sources and seasons;</td>
</tr>
<tr>
<td></td>
<td>• frequency and appropriateness of chlorinization of wells, tanks, and piped-water systems;</td>
</tr>
<tr>
<td></td>
<td>• percentage of households satisfied with the taste and appearance of water in different seasons.</td>
</tr>
<tr>
<td><strong>Functioning of water supply systems</strong></td>
<td>• number of days per year in which household wells or taps are not functioning;</td>
</tr>
<tr>
<td></td>
<td>• percentage of households relying on domestic water harvesting systems;</td>
</tr>
<tr>
<td></td>
<td>• presence and function of local water committee controlling maintenance and support for water supply;</td>
</tr>
<tr>
<td></td>
<td>• number and availability of local mechanics with training to repair wells or taps;</td>
</tr>
<tr>
<td></td>
<td>• liters lost per minute due to major leakages in the supply system;</td>
</tr>
<tr>
<td></td>
<td>• seasonal differences in depth of water table.</td>
</tr>
</tbody>
</table>

- construction of rain-water harvesting systems (e.g., a system of pipes or channels to capture water from the roof of a house and store it in a cistern);
• improvement and maintenance of water distribution systems (e.g., providing ideas about the technology of a water system, labor for its construction, and arranging for the training of local mechanics to maintain the system):
• monitoring of the quality of water for human consumption;
• building appropriate human sanitation facilities (e.g., latrines, toilets);
• afforestation, building bunds, and contour plowing for increased soil moisture and groundwater recharge.

Another important natural resource linked with water is wetlands, e.g., swamps, sloughs and shorelines. Many useful items are extracted from wetlands, e.g., food (fruits, meat, fish), building materials (trees, reeds), water (for irrigation, drinking, washing), traditional medicines, etc. In addition, wetlands are important locations for cultivation and dry-season grazing. For instance, the moist dambo lands along the upper valleys of streams in Malawi are able to produce two crops per year compared to the single growing season on the surrounding eroded and semi-arid hillsides. Wetlands, and the plants and animals which are adapted to such regions, are under tremendous pressure from expanding populations. Drainage for agriculture is estimated to have resulted in the loss of 26 percent of wetlands worldwide (OECD/IUCN, 1996).

Soil
Between 1945 and 1990, over one-tenth of the world’s vegetated land (approximately 1.2 billion hectares) has suffered at least moderate soil degradation as a result of human activity. Cultivation has reduced the world’s pre-agricultural supply of organic carbon by about 15 percent: about 60 billion tons of soil carbon have risen from the soil to the atmosphere as climate-warming carbon dioxide (Engelman and LeRoy, 1995). In recent times, the most widespread soil degradation has occurred in Asia (450 million hectares) and Africa (320 million hectares), mostly because of extending agricultural frontiers, overgrazing and deforestation.

At the local level, processes of soil degradation may include:
• decrease in depth of the humus stratum (the unconsolidated mineral and organic material on the immediate surface of the earth, which serves as a natural medium for the growth of plants);
Table 2.5
Some indicators of soil loss and soil conservation initiatives at the local level

<table>
<thead>
<tr>
<th>Topic</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil loss</td>
<td>• arable/barren land ratio;</td>
</tr>
<tr>
<td></td>
<td>• percentage of land affected by major erosion (gullies, land-slides, etc.);</td>
</tr>
<tr>
<td></td>
<td>• percentage of land abandoned in a given period of time due to low yields;</td>
</tr>
<tr>
<td></td>
<td>• reported changes in cropping patterns due to changes in soil fertility;</td>
</tr>
<tr>
<td></td>
<td>• extent of soil sediments in local streams;</td>
</tr>
<tr>
<td></td>
<td>• frequency of occurrence of problematic soil (e.g., strong acidity, salinity).</td>
</tr>
<tr>
<td>Soil conservation initiatives</td>
<td>• percentage of arable land with soil conservation measures implemented (terraces, wind-breaking hedges, etc.);</td>
</tr>
<tr>
<td></td>
<td>• length of terraces, wind-breaking hedges, etc.;</td>
</tr>
<tr>
<td></td>
<td>• surface area under biological and/or physical control of erosion;</td>
</tr>
<tr>
<td></td>
<td>• percentage of productive units implementing soil conservation measures;</td>
</tr>
<tr>
<td></td>
<td>• percentage of productive units using good manuring and cultivation practices;</td>
</tr>
<tr>
<td></td>
<td>• percentage of fallow land recovered for agricultural purposes;</td>
</tr>
<tr>
<td></td>
<td>• percentage of cattle reared in stables.</td>
</tr>
</tbody>
</table>

- decrease of soil fertility and productivity (fewer varieties of plants will grow and their yields are lower);  
- increase of the surface exposed to erosion phenomena (i.e., total wash-out of the humus stratum); and  
- desertification (the extension or development of barren lands in areas previously covered by vegetation).

Indicators for assessing soil degradation at the local level and for evaluating the implementation of important remedial actions are presented in Table 2.5.

Soil conservation and recovery action is usually undertaken in the framework of extensive public-works programs. Actually, conservation measures usually require a surplus of land or labor, which cannot generally be afforded by small-farmer household economies. Even so, if sound income-generating incentives are provided, relevant initiatives can be implemented at the local level with limited investments. Community-based initiatives for soil conservation and recovery may include:
Case Example 2.8

Soil conservation in a dry climate

Since independence, the Tanzanian government has established a number of integrated land conservation programs in the semi-arid interior of the country, where dry savannah prevails and people depend on pastoral and agro-pastoral economies. In most of these areas, land degradation is a common consequence of excessive grazing and insufficient soil and water conservation measures (all of which arose from the clearing of woodlands done in the first half of this century for tsetse fly eradication).

In the 1970s and early 1980s such conservation measures ranged from machine-intensive works to labor-intensive construction, from check-dams and woodlots to the relocation of people and outright enclosure of severely degraded areas. Some ecological results were impressive, but local people rarely offered their genuine participation in these measures. At times, they even defied government regulations openly, for instance, by keeping their herds where grazing was illegal, and organizing among themselves to pay the fines collectively.

More recent soil conservation programs have learned from these experiences. First, local villagers are now involved in negotiations from the beginning, resulting in enclosures that are generally smaller and do not involve resettlement of many households or villages. Second, negotiations take into account a variety of aspects of resource conservation and use, and thus proceed for a longer time but end up in more complex and sophisticated regulations. Third, the Tanzanian Forest and Bee-keeping Division is now taking full advantage of existing local associations and traditional management practices.

For instance, among the Sukuma people in the region of Shinyanga, there exist traditional grazing reserves (called ngitire), where herds are allowed to graze only during the dry season. Most of these reserves are established on communal land, in hilltops or river valleys, and under the strict control of village leaders. The Forest and Bee-keeping Division negotiates now with local leaders and associations for the extension of these traditional reserves, as well as for de-stocking practices, woodlot management and controlling the use of other resources. Local organizations like the Sungusungu (originally groups of young warriors who protected the herds against theft) are fully enlisted in resource management tasks and capacities, and special funds are created in each village to help them carry out various activities.

- building slow formation terraces on slopes;
- gully and land-slide control (e.g., by contour farming, small-scale afforestation, planting soil-binding grasses in high-risk areas, etc.);
- improvement of cultivation practices (e.g., planting wind-breaking hedges, introducing nitrogen-fixing crops);
- promotion of biological and/or proper chemical manuring;
- introduction of crop-rotation;
- improvement of irrigation and drainage systems;
- introduction of stable livestock-rearing technologies.
Case Example 2.9
Surviving the winds of change:
Karen people live in harmony with World Heritage

One of the few remaining refuges where the forest-dwelling Karen people have been able to maintain their traditional lifestyle is inside the Thung Yai Naresuan Wildlife Sanctuary in Thailand. Within the sanctuary, there are six villages which are home to a population of 1,100 Karen people. Government officials from the Royal Forest Department, some conservationists and some academics have been in favor of the removal of the villages in order to preserve the forest ecosystem. The relationship between the Karen people and most outsiders has been marked by mutual mistrust and misunderstanding. The debate over the resettlement of the Karen from Thung Yai intensified when Thung Yai was declared a World Heritage Site.

The threat to the Karen’s continued survival in Thung Yai has been championed by a loose coalition of grassroots and conservation groups. This coalition advocated the Karen’s rights to remain in the Sanctuary, which they have occupied for centuries. Meanwhile, various efforts have been undertaken to document and better understand the impact of the Karen’s cultural and subsistence practices on their environment, as well as to provide environmental education and basic extension services in Karen villages.

Anthropologists and agricultural researchers found out that the Karen people have an agricultural management system defined by rules ensuring that their cultivation practices do not deplete the soil. For example, a Karen family never plants more than three plots of land and they select their rice and vegetable plots only after bamboo shoots emerge in order to avoid disrupting the natural forest cycles. The Karen also employ a system of multi-cropping rice with various other crops to balance the nutrients in the soil, plant several rice varieties to protect the crops from pests and diseases, and apply natural fertilizers.

This documentation of the Karen’s environmentally sound agriculture counteracted the Thai government officials’ perception that the Karen belong to the category of destructive slash-and-burn agriculturists. Partly as a result of advocates’ efforts in documenting the cultural and agricultural practices of the Karen, the Karen people have been allowed to remain in Thung Yai. Uncertainty is still high, however, as to the Karen’s permanent status in the Sanctuary, as land and forest policies tend to change with successive governments.

From: Hulse and Thongmak, 1996

Before introducing new soil conservation technologies, it may be crucial to determine whether the local culture is familiar with techniques and means to control erosion and maintain fertility of the soil. Reviving and strengthening peasant know-how in this area is often the best way of dealing with problems related to soil management at the local level.

Forests
Before the agricultural revolution, forests were the most prevalent biome on Earth (approximately one-third of the total). Currently, only 9.4 percent of the planet’s surface is covered by forests. Over the centuries, due
Box 2.7

Variable use of forest resources in three villages in Sri Lanka

Three villages in close proximity to each other in the Tihagoda district of Sri Lanka's southern tropical rain forest area illustrate the potential for wide variations in the use of a similar set of local resources.

The Batuwita Village has long supported itself through the production of household items made of bamboo and rattan. The average household receives an income of Rs. 32,000 per year (US$650 in 1993) from the sale of these products. Since the rattan and bamboo supplies in the immediate vicinity of this village have been exhausted, villagers now must travel 45km (by bicycle) to obtain these resources.

In the Akkarapanaha Village, rattan and bamboo are collected in small quantities from nearby areas, primarily for the village's own use. A more significant source of income is the sale of meat that has been hunted from the forests.

In the Narangala Village, the public forest is mainly used to collect fuel wood. Villagers collect substantially (50 percent) more fuel wood than other villages in the Tihagoda District. This community reports virtually no income from forest products, but is the only village of the three that uses forest areas for grazing.

to the growing demands for large-scale timber production and agricultural land, forests have been replaced by secondary woodlands, savannah, pasture areas and cultivation. Timbering for local uses and fuel wood has also contributed to deforestation, especially around settlements.

Today, deforestation continues, despite widespread awareness of the many environmental benefits provided by forests, such as:

- protection of watershed and regulation of water flow;
- prevention of soil-erosion;
- contribution to the balance of the carbon cycle; and
- giving back moisture to the atmosphere.

Forests also provide important economic benefits to local communities, such as game, wild fruits, mushrooms, timber, fuel wood and other vegetal products (e.g., latex, dyes, waxes, medicinal plants, etc.), (see Box 2.7). Sustainable exploitation of the forests is a basic component of local subsistence strategies, especially in the tropics, where a significant proportion of dietary proteins and micro-nutrients is obtained through hunting, fishing and gathering. In addition, forests supply well over 90 percent of the total energy used for domestic purposes in poorer nations.

Large-scale reforestation and afforestation are strategies at the national level for improving forests. Frequently, however, these plans clash with
Case Example 2.10
Involving the stakeholders: Joint Forest Management in West Bengal, India

West Bengal, which has historically suffered from virtually uncontrollable resource degradation and species loss, is where Joint Forest Management (JFM) has been most successfully implemented (in 75 percent of the forests/woodlands). With the program, the relationship between villages and forest department officials greatly improved. Whereas in the past the forest officers were primarily involved in policing activities, they are now acting more as mediators/public relations officers between community Forest Protection Committees and the upper echelons of the Forest Department.

The Sal Forest is clearly regenerating under the JFM agreements. Villagers can access and use Non-Timber Forest Products (NTFPs) for household needs and as income generators (e.g., sal leaves, gums, edible insects, resins, medicinal plants). Interestingly, this system has succeeded despite a significant increase in human population which took place at the same time and in the same districts where forest regeneration occurred.

When the 10-year regrowth cycle is completed, villagers fear (and officials anticipate) that there will be a glut in the market as an excessive number of sal poles will be ready for harvesting. Some Forest Protection Committee members would like the sal trees to be left standing and harvested during more economically favorable circumstances. Other villagers and tribal healers are also encouraging further ecological succession and species diversification within the Sal Forest rather than timber harvest after the 10-year cycle.

Whilst the West Bengal experience in JFM is clearly inspiring, the attitudes and behavior of some forest officers remain problematic. Informal comments by foresters at different levels within the Forest Department hierarchy often describe village tribal people and their FPC as ‘ignorant’, ‘primitive’, ‘underdeveloped in all aspects’ and ‘economically irrational’. Similarly, the Forest Department’s rigid and state-wide regulations (e.g., on choice of tree species, silvicultural practices and timber harvest time) are at odds with what is required for local-level adaptive planning, which takes into account the diversity of ecological, social and economic situations in forest management.

The crucial issue which needs to be resolved in the near future basically hinges on how to move from Forest Protection to full Participatory Joint Forest Management. Devolving more responsibility for key silvicultural and income-generation decisions to village institutions may be essential to achieve the twin goals of conservation and local livelihood security.

From: Pimbert, 1994

the short-term interests and immediate needs of local communities. An important alternative is the community forestry approach (Lee Peluso et al., 1994). In this community-based strategy, local people are actively involved in planning and managing activities that, on the one hand, protect the forest as a whole and, on the other, assure them access to fuel, food and other forest items necessary for livelihood and income-generating activities (a fairly typical example of primary environmental care).
Case Example 2.11

Ethnic groups and firewood consumption

The customs of different ethnic groups can greatly influence the use of natural resources. For example, in Nepal, some ethnic groups consume firewood at higher rates than others. Traditionally, Brahmin and Chettri ethnic groups never drink alcohol and do not brew liquor in their homes. In contrast, ethnic groups such as Tamang, Gurung, Kirati, and Sherpa in the highlands, and Tharu and Rajbansi in the tropical plains practice home brewing. Interviews with alcohol-brewing and non-brewing ethnic groups in one village found that brewing households consume 20 percent more fuel wood than the others.

Contributed by Krishna Oli

Forestry management can be an opportunity for community development. Since a forest is better protected as a whole than in isolated patches, forestry activities offer the rationale for organizing (e.g., in a local users' association) to distribute the benefits that come from the forest (e.g., fodder or water) in an equitable way.

The objective of community forestry is to promote sustainable use of forest areas by the local population. Conservation of the forest base thus represents a means of:

- ensuring availability of fuel, building materials, and other goods (e.g., forest foods, traditional medicines, etc.);
- providing the environmental stability necessary for food production (e.g., maintaining the water table, preventing erosion, etc.); and
- generating income and employment.

To achieve the above objectives, agro-forestry technologies have been developed, often on the basis of local knowledge. These include:

- semi-cultivation of timber and other valuable species;
- management of animal and vegetal species important to the local diet;
- improvement in the efficiency of cooking-stoves;
- selective cutting of trees for timber and fuel wood;
- pest and fire control; and
- development of ecological tourism.

Indicators for assessing the forest situation at the local level and the results of community-based agro-forestry activities are presented in Table 2.6.
Table 2.6
Some indicators of forest conservation at local level and community-based agro-forestry activities

<table>
<thead>
<tr>
<th>Topic</th>
<th>Indicators</th>
</tr>
</thead>
</table>
| Forest conservation        | • percentage of territory covered by primary and secondary forests at different points in time (e.g., current, one generation ago, etc.);
                          | • annual deforestation rate (hectares cleared per 100 hectares of arable land in one year);
                          | • percentage of forest effectively protected by the state, local communities or both;
                          | • frequency of small and large fires;
                          | • biodiversity of different forest ecotypes (e.g., number and status of different vegetal and animal species, presence of endangered species);
                          | • existence of business interests involved in or aiming at timber exploitation in the area;
                          | • existence of communities solely dependent on the forest for food, firewood, income, etc.                                             |
| Agro-forestry activities   | • surface area of new plantations, enrichment planting and natural regeneration;
                          | • number of species planted;
                          | • survival rate by species;
                          | • percentage of households involved in agro-forestry activities;
                          | • percentage of average household income generated from agro-forestry activities;
                          | • diversity of forest products being used, appropriateness of harvesting methods and amount of product harvested. |

Wildlife
We understand as ‘wildlife’ all non-domesticated animals and plants which are, or could be, used or valued in any way by people (IIED, 1994). Wild plants can include flowers, grasses, fruits, leaves, bark and roots which provide medicines, fibers, fuel, building materials and food for livestock. Wild animals can include both vertebrates and invertebrates, providing meat, fur, bone, trophies and ivory, and cultural items. Wildlife is inseparable from its habitat (forests, range lands, wetlands, reefs, mountains), and it is typically through habitat destruction that most species are lost.

The primary threat to wildlife comes from a combination of demographic, economic and political factors. Expanding populations and migration to frontier areas are increasing the pressure on wildlife and, in most cases, leading to over-exploitation. The international economic
### Table 2.7

**Some indicators of wildlife conservation at local level and community management status (including use)**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wildlife conservation</strong></td>
<td>• species richness at different point in time (e.g., current, one generation ago, etc.);</td>
</tr>
<tr>
<td></td>
<td>• annual deforestation or afforestation rate (hectares cleared per 100 hectares of arable land in one year);</td>
</tr>
<tr>
<td></td>
<td>• loss or gain of wetlands (hectares drained or cultivated per year, hectares reflooded);</td>
</tr>
<tr>
<td></td>
<td>• loss or gain of specific habitats (e.g., a kind of tree which is the only place where some birds can build their nest).</td>
</tr>
<tr>
<td><strong>Wildlife management</strong></td>
<td>• existence of local institutions or groups (i.e., committees or user groups) with management capacity, responsibility and authority;</td>
</tr>
<tr>
<td>(including use)</td>
<td>• number of plant or animal species currently under some sort of ‘management rule’ (i.e., restricted use for non-locals, seasonal hunting/gathering, etc.);</td>
</tr>
<tr>
<td></td>
<td>• methods used in hunting and gathering (destructive? careful to maintain species viability? etc.);</td>
</tr>
<tr>
<td></td>
<td>• species planted/re-introduced;</td>
</tr>
<tr>
<td></td>
<td>• survival rate by species;</td>
</tr>
<tr>
<td></td>
<td>• percentage of local caloric and protein intake derived from hunting and gathering of wildlife;</td>
</tr>
<tr>
<td></td>
<td>• percentage of local income generated from sale of wildlife products or other activities;</td>
</tr>
<tr>
<td></td>
<td>• number of households that rely on traditional forms of medicine using local plant or animal products;</td>
</tr>
<tr>
<td></td>
<td>• percentage of households involved in hunting/gathering activities.</td>
</tr>
</tbody>
</table>

System, with its insatiable demand for resources, has also led to the depletion of wildlife in large regions. To use an extreme example, hunting of rhinoceros for the supposedly aphrodisiac qualities of their horns has nearly led to their extinction in some countries. In addition, many countries are converting the wildlife’s habitat into cropland for export-oriented agriculture to pay off national debts. In addition to demographic and economic factors, political factors, such as inappropriate land-tenure arrangements or inadequate pricing for farm produce, can limit farmer incentives to invest in sustainable agricultural practices that might reduce the amount of new land clearing (McNeely, 1990).

Although wildlife is mostly an asset for local villages, it can also be a menace. Animals may compete with humans for the same food, destroy crops and economic property and serve as a vector for disease. Some predatory animals can even directly attack humans. Thus, in any wildlife
Case Example 2.12

Protected areas and local people: Ngam-gam in the Upper Togo

In the 1970s, the Togolese government introduced a highly centralized policy of protected area management and natural resources conservation. Government conservation policy focused on land protection *per se*, and hunting of all but small animals was banned throughout the entire country. Moreover, the law was enforced without any assessment of people’s needs or complementary programs (e.g., compensation for socio-economic infrastructures or land lost, enhancement of arable land, participatory management).

The savannah of north-eastern Togo, which is traversed by the Oti, Keran and Kara rivers of the White Volta basin, had been inhabited for centuries by the Gourma-speaking people. In 1981, the creation of the Oti-Mandouri Wildlife Reserve and enlargement of the Kéran National Park reduced the traditional territory of the 23,000 Gourma-speaking Ngam-gam people from 2,300 square kilometers to 800 square kilometers. Among the Ngam-gam, the area occupied by the reserve is important for economic activities (i.e., hunting, fishing and rice cultivation in the *varzeas* area of the Oti) as well as religious and ritual purposes. Nevertheless, the Ngam-gam living in areas which are now protected were ‘convinced’ by the army to move elsewhere, and they were forbidden access to all the natural resources in that area.

With no possibility of hunting and with reduction of the areas used for fishing and gathering of wild fruits, the Ngam-gam were obliged to depend exclusively on agricultural crops and to subsist on a diet low in proteins and less varied than before. In part, this was because the area in which they were obliged to settle had poor soil and very little water, so their traditional cultivation techniques were not appropriate and crop production was poor. In addition, the meager harvests were often destroyed by elephants, warthogs, monkeys and wild pigs, which crossed from the unfenced park and which the Ngam-gam were not allowed to hunt.

As a result, the protected areas became for the Ngam-gam “food larders surrounded by hunger.” They are now considered as symbols of an expropriation for the benefit of foreign tourists and members of the national political élite. In 1990, the hostility of the Ngam-gam and other Gourmas surrounding the forest exploded in social and environmental upheaval. Uncontrolled tree felling, illicit land clearing and systematic slaughtering of wildlife became acts of vengeance against government authorities.

A partial land-declassification in the Kéran National Park in 1991 has not satisfied local people. According to a recent survey of 20 protected areas in Togo, most of these communities are aware of the ecological importance of forests for rainfall, soil fertility and conservation of biodiversity, but they want to redefine the boundaries of the protected areas as they were defined during the colonial period and to be allowed to hunt outside the protected areas. The survey identified a clear need for involving local populations in the participatory management of protected areas and the natural resources around them.

*Adapted from: Tchamie, 1994*
African experiences in participatory management of protected areas

An innovative approach to participatory environmental protection was successfully developed in the mid-1980s in Zimbabwe and Zambia. The Communal Areas Management Program for Indigenous Resources (CAMPFIRE) was developed on the basis of two assumptions: a) that people living with wildlife pay the price for conservation through the threat of injury by dangerous animals and damage to crops and, most of all, via foregoing other productive uses of local territories – they should thus reap a good proportion of the benefits accruing from wildlife; and b) that local people and local governments can effectively manage wildlife resources. Since the program was launched, through the granting of appropriate management authority to districts, a substantial flow of revenues has been directly employed for infrastructural development (to benefit both people and wildlife), invested in income-generating projects and shared among local households (Makombe, 1994). The results of the approach are impressive. Local wildlife is thriving, as the rural residents behave more as caretakers than enemies or competitors (e.g., during the severe drought in the early 1990s, villagers dug deep holes for the elephants to drink from).

Recently, the West African Game Ranching Program (WAGREP), inspired by the CAMPFIRE experience, has been developed for protected areas in Burkina Faso and the Ivory Coast. WAGREP also plans to involve traditional hunting societies in the participatory management of wildlife resources and to reinforce, through a local radio network, the capacity of the local people to control land against poachers, fires, indiscriminate cutting of trees, etc. According to a survey conducted in 1992 by the IUCN among the Lobi of Burkina Faso (Kambou, 1992) and to an FAO community forestry management program in Mali, traditional hunting societies are extremely active all over West Africa, and they still play an important role in the decision-making processes of the rural community. In the rapid development of rural societies in Africa, they would be keenly interested in being involved in national park management, which would benefit from the experience and knowledge of wildlife they have accumulated over centuries.

management strategy it is important to identify what are the most useful plants and animals, what species should be preserved for their ecological, aesthetic or economic value, and which species need to be managed so as to prevent their negative impacts on local villages. For instance, rural parts of Zimbabwe have a serious problem with elephant trampling fields. The government is now espousing a form of controlled culling of elephant herds (to replace strict controls that were instituted in response to rampant poaching), while solar-powered electric fences have been erected around farmers’ fields (where practicable) to keep elephants out.

Protected areas

Protected areas are legally established sites dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources (IUCN, 1994). Unfortunately, in many developing countries local residents are rarely involved in planning, managing and benefiting from such protected areas and the resources they contain, and conflicts between protected area authorities and local people are the rule
The term 'collaborative management' (also referred to as co-management, participatory management, joint management, shared management, multi-stakeholder management or round-table agreement) is used to describe a situation in which some or all of the relevant stakeholders in a protected area are involved in a substantial way in management activities. Specifically, in a collaborative management process, the agency with jurisdiction over the protected area (usually a state agency) develops a partnership with other relevant stakeholders (primarily including local residents and resource users) which specifies and guarantees their respective functions, rights and responsibilities with regard to the protected area.

In general, the partnership identifies:

- a protected territory (or set of resources) and its boundaries;
- the range of functions and sustainable uses it can provide;
- the recognized stakeholders in the protected area;
- the functions and responsibilities assumed by each stakeholder;
- the specific benefits and rights granted to each stakeholder;
- an agreed set of management priorities and a management plan;
- procedures for dealing with conflicts and negotiating collective decisions about all of the above;
- procedures for enforcing such decisions; and
- specific rules for monitoring, evaluating and receiving the partnership agreement, and the relative management plan, as appropriate.

Collaborative management regimes and other similar arrangements can and do operate also in territories that do not have a protected area status, and can apply to virtually all types of natural resources. Forests, fisheries and coastal resources, grazing lands, wildlife and even non-renewable resources (e.g., oil and mineral deposits) are included in existing management agreements among various parties.

From: Borrini-Feyerabend, 1996

rather than the exception (see Case Example 2.12). This is particularly unfortunate, as there is great potential for protected areas to benefit local residents while protecting biodiversity (see Case Example 2.13).

In general, a situation in which local residents and the authorities in charge of the protected area are in collaboration rather than conflict is certain to assure the best conditions for long-term sustainability (see Box 2.8). This is particularly true when the access to the natural resources included in the protected areas is essential for local livelihood security and cultural survival. But it is also most important when commercial
Box 2.9

Critiques of the carrying capacity concept

At its heart, the concept of carrying capacity gives a privileged position to population density among the factors that lead to land degradation. This has led to two principal criticisms. On the one hand, the concept is overly deterministic and underestimates the human capacity for technological innovation. On the other, it ignores the complexity of the ‘real world’, in which trade, public policy and land distribution all affect the relationship between human populations and land degradation.

Boserup (1965) argued for the first criticism when she pointed out the inadequacies of the Ricardian-Malthusian assumption of constant technology, and proposed an alternative theory that as population grows, land becomes scarce and therefore is used more intensively. New agricultural technologies, including the use of fertilizer, irrigation and intercropping, can lead to higher yields per unit area. If in certain parts of the world carrying capacity has been surpassed, critics of the concept would point to areas that are both densely settled and highly productive due to the use of appropriate technologies.

As for the second criticism, the concept of carrying capacity has been most frequently tested in micro-level studies of islands, distinct regions or nation-states. According to Brookfield (1992), the often unstated assumption of a subsistence economy with little or no trade, little government intervention and free access to land, renders these studies effectively meaningless in a complex and interdependent world.

From: de Sherbinin, 1993

forces (timber companies, mining and oil extraction industries, large tourist entrepreneurs, etc.) are interested in the protected resources. Generally, neither local communities nor the protected areas authorities alone have the power to resist those forces, but together they can, as together they can counteract the destructive tendencies of some of their own members (Kothari et al., 1996).

Carrying capacity for human populations

Human ecologists define carrying capacity as the maximum size of a human population that can be sustained by an ecosystem over a given period without degrading environmental resources (McElroy and Townsend, 1989). The capacity to sustain a human population may vary greatly from one natural ecosystem to another. Obviously, we cannot expect the Sahara Desert or the Polar tundra to have the same potential for hosting humans as the fertile valleys of large rivers such as the Rhine, the Nile, the Ganges and the Mississippi. Some key differences (though not the only ones) between these extreme examples are rainfall and water availability, chemical composition and physical texture of soil and climate. These factors influence the flora and fauna and thus the potential for food production.
Case Example 2.15

The ecological collapse of a tropical rain forest civilization

Between the third and the ninth century AD, the Maya built more than 80 towns in the jungle covering the Petén region in southern Yucatan (Guatemala). The largest of these centers was Tikal, which at its zenith was inhabited by approximately 40,000 persons. At that time, the average density of the Petén Maya territory has been estimated at 250 persons per square kilometer. Such a high demographic concentration in a tropical rain forest ecosystem (whose carrying capacity is known to be very limited) has puzzled archaeologists, anthropologists and human ecologists.

How did classical Petén Maya manage to extract from the fragile tropical environment the amount of basic nutrients needed to support such a large and dense population? Answers are partly related to local ecotypes of the Petén jungle (which are very different from those of the Amazon and Orinoco watersheds), and partly to innovations of the Maya in the typical slash-and-burn horticulture of manioc and maize. These included large-scale cultivation of chestnuts, which may have provided up to 80 percent of the calories consumed by Tikal in the ninth century, and construction of extensive irrigation and drainage channels.

Evidence suggests that beginning in the early ninth century Tikal and other large Mayan settlements started to decline, with populations decreasing in both size and density. While the duration of this decline is still disputed, when the Spaniards reached the Petén in the 16th century, its population density was similar to that in other tropical rain forest areas of South America: 1–2 inhabitants per square kilometer (i.e., 125–250 times less than during the zenith of Mayan civilization). Today, the Petén jungle is almost deserted.

The sudden fall of a large urban civilization is quite common in Mesoamerican archaeology, but the fact that during the following centuries no other civilization replaced the Maya in the Petén jungle has remained a riddle to scholars. Marvin Harris suggested that the decline of the Maya may have been related to the fragility and vulnerability of the ecosystem on which this civilization developed.

Population growth and agricultural development certainly led to extensive deforestation (a phenomenon witnessed by the man-made savannahs scattered throughout the Petén jungle). This resulted in increased erosion in the upper part of the area. The great amounts of sediment brought down by tropical rain may have rapidly filled the channel beds, making the irrigation systems difficult to maintain. Moreover, the extent of deforestation may have led to dramatic changes in the rainfall regime, increasing the average length of the dry season and causing recurrent droughts.

In the time span of two or three centuries, the fragile balance between the Mayan population, their culture and their environment collapsed. If this interpretation of the fall of the Petén Mayan civilization is correct, it presents an important historical example of the social and demographic crisis a society faces when its population exceeds the carrying capacity of its ecosystem.

Adapted from: Harris, 1977
China provides an example of both the potential and the limitations of improved technology for expanding food production. New management practices and technologies have resulted in more productive agro-systems and substantially increased the carrying capacity in most areas. For example, under pastoralist management, one hectare of grazing land in China could only support 1–2 persons. Traditional farming with careful recycling of organic fertilizers raised the carrying capacity to 5–6 people per hectare. Today's cultivation, which increasingly relies on large inputs of nitrogenous fertilizers, can sustain 10 people per hectare (the national average). In Sichuan, China's most populous province, 17 people are able to be fed from each hectare.

Carrying capacity has thus been raised impressively over the past several thousand years in China. However, although some constraints on food production were removed (for example, loss of herds during cold winters or crippling damage of crops due to pests), new ones have emerged in their place. Today, China's carrying capacity rests critically on the availability of fossil fuels and electricity to provide synthetic fertilizers and pump the water needed for new, high-yielding crop varieties.

From: Mahar, 1985

Food availability (or more exactly, availability of calories, proteins and micro-nutrients) is the most direct measure of human carrying capacity of a given ecosystem. Around the world, the rural areas with the heaviest population pressures are those in which the natural conditions (physical, chemical and biological) for food production are the best.

Over the past 10,000 years, mankind has developed an increasing capacity to extract food value from the environment (see Case Example 2.14). Hunting, fishing and gathering, which were practiced for nine-tenths of the evolutionary history of humans, have been increasingly displaced by more efficient ways of exploiting natural resources, such as agriculture and animal breeding. Among the important customary or traditional agricultural practices which are known to increase productivity in an environmentally benign way are small-scale irrigation, animal traction, biological manuring and crop rotation. More recently, large-scale engine-powered agriculture, chemical control of soil fertility, pesticides and genetic improvement of plants have dramatically increased these techniques for squeezing out every possible calorie and protein from the local resource bases.

Thus, within certain natural limits, the carrying capacity of a given environment can be increased by cultural (or, more specifically, 'agri-cultural') means. On the other hand, history and archaeology provide us with several examples of human populations that faced impressive crises because of their failure to respect their local environmental limitations (see Case Example 2.15).
It is therefore reasonable to ask how far a given community is from the absolute ‘limits’ of the carrying capacity of its environment. A rough estimate of carrying capacity can be obtained by comparing local food production with population size. Although estimates based on food production and other proxy measures of effectiveness and efficiency in resource-based exploitation are useful, full calculation of carrying capacity is not completely answered by a single indicator. A more detailed profile requires complex statistical models that combine natural variables (latitude, altitude, climate, soil, water, fauna, flora, etc.) with economic, social and political factors (such as available technology, trading exchange network, presence of infrastructures, land ownership and other aspects of the overall mode of production).

For the sake of local development and conservation activities, however, these sophisticated and expensive studies are rarely necessary. Participatory appraisal techniques focusing on key resources (such as arable land, water, fuel wood, wildlife, etc.), seasonal food availability, and nutritional status (see Chapter 4) can provide sufficiently valid information and practical advice from within the community about uses of natural resources, risks of resource degradation and ways to cope with those locally (see Case Example 3.2, p. 83, for an inspiring example of primary environmental care which achieved better local management of resources and, thus, an increased local ‘carrying capacity’).
3. Participatory action research (PAR)
Involving people in the analysis of the problems that affect them and in the design of potential solutions is the best way to achieve sustainable development in the truest sense of the term. Though more time-consuming, perhaps, than traditional conservation and development approaches that rely on 'blueprint' plans and development 'experts', participatory approaches generally lead to environmental conservation efforts that are sustained over the long term – because the people themselves have an interest in their success. This chapter provides some principles and methodological considerations for carrying out participatory action research. Beginning with a discussion of the term 'participation', we lay the ground for the material which follows in Chapters 4, 5 and 6. In those chapters, readers will be introduced to specific techniques for conducting participatory action research on local population and the environment.

3.1 Participation

3.2 Participatory project management
Partnerships between local and non-local actors

3.3 Participatory action research: general features

3.4 Participatory action research: basic methods and techniques
Participant observation
Interviewing – for qualitative and quantitative information
Facilitating group meetings and exercises

3.5 Participatory action research: conditions for success and problems of validity
Community acceptance
Staff technical know-how and attitudes
Validity and reliability of participatory action research results
3.1 Participation

If we understand ‘participation’ in the simplest of its meanings – taking part, sharing, acting together – people’s participation is nothing less than the basic texture of social life. For millennia, people have ‘participated’ in shaping their cultures and survival strategies in an immense variety of ecological environments. For the greater part of the existence of Homo sapiens, this sharing of tasks and responsibilities has taken place in self-regulated small groups – 50 to 60 individuals who interacted in a face-to-face way and shared the hunting, gathering, leisure and learning of daily life.

With the advent of agriculture, and even more so with the advent of industrial production, social units grew in size and became internally diversified and specialized. Regulations and enterprises developed and promoted by special groups had to face the consensus, the indifference or the opposition of the rest of the people. Spontaneous participation became an important test of confidence and trust.

In recent decades, large-scale planning, governmental services and regulations, entrepreneurial projects and development schemes have increasingly dominated socio-political life. In this context, ‘people’s participation’ is appreciated and sought by virtually all institutions, large and small alike. Why is it so? What benefits can be expected from it and, in particular, what benefits for activities related to population dynamics and environmental conservation?

To begin with, participation is a condition by which local knowledge, skills and resources can be mobilized and fully employed. Local people may know very well the causes and possible remedies of deforestation or soil erosion in their environment. They may know where to find and how to use plants of unique properties or how to prevent animals from damaging new seedlings. They may be able to offer labor, land, food, shelter or tools for the running of a project. Contributions like these increase the flexibility of an initiative and its responsiveness to local conditions, they reduce the chances of mistakes with major environmental consequences and often make up most of the difference between success and failure. In fact, the overriding benefit of people’s participation is the increased effectiveness of any initiative.

Another major benefit is a more efficient use of resources. In fact, local knowledge and skills help minimize waste and obtain results with
Box 3.1

What to expect from people’s participation in a conservation initiative

- local knowledge, skills and resources are used more fully
- the initiative becomes more effective and more efficient
- local people and outsiders share and enhance their awareness of problems, resources and opportunities
- local people and outsiders share and diversify their relevant knowledge and skills
- local associations and institutions are created or become stronger and more capable
- local initiative and self-reliance are encouraged and cultivated
- the local society is likely to become more mature, non-paternalistic
- ‘development’, ‘democracy’ and ‘equity’ are broadly promoted

... in all, the initiative becomes much more sustainable.

...i n all, the initiative becomes much more sustainable.

limited investments; participation can bring to the project the full benefits of human and material resources that would otherwise remain idle or poorly utilized; and local monitoring discourages the undue use of assets and promotes accountability and the respect of rules.

Most of all, however, the participation of local people provides a unique assurance of the sustainability of conservation initiatives. In fact, local people are – at least potentially – the most directly interested in the positive results of such initiatives. When they initiate them or participate in setting them up, when they invest in them their own hopes and resources, they are likely to remain motivated to sustain them in the long run. In fact, most local communities possess greater stability and continuity than national governments; their investments are made for the next generations rather than for the next elections.

Agencies concerned with the effectiveness, efficiency and sustainability of conservation and development initiatives can thus profit from people’s participation. But participation directly benefits local people as well. When people take part in assessing population dynamics, environmental problems, resources and opportunities, they acquire information and enhance their awareness of factors playing a role in their lives. When they act and contribute, they often acquire new skills and face the opportunity of organizing themselves – with a variety of returns for local equity, self-reliance and building of community or group identity.

In fact, the benefits of genuine people’s participation in initiatives for the common good are so many that for some authors the concept merges with other concepts, like democracy and development, and makes the whole difference between a mature and free society and a paternalistic and possibly oppressive one.

most local communities possess greater stability and continuity than national governments; their investments are made for the next generations rather than for the next elections
Case Example 3.1
Participation in a population-environment project

The Orangi Pilot Project (OPP), located in a slum district north of Karachi, Pakistan, has successfully blended both population and environmental activities into one integrated project using participatory approaches. Begun in 1980 as a sanitation project to introduce flush latrines, the OPP staff organized the local population, and involved them in self-financing and building the project. As a result of the collective efforts of community members, latrines were introduced in more than 50,000 homes.

OPP moved from sanitation into the health field (disease prevention) and ultimately, based on women’s expressed needs, into reproductive health and family planning. In Pakistan, women’s mobility is limited for cultural reasons. In order to reach them, it was thus necessary for project workers to go into the homes or neighborhoods of potential clients. Because the service needed to be delivered to the door, it was important that the outreach workers would be women who were trusted by the clients.

The solution was to train local women as family planning suppliers and motivators. OPP developed a three-month-long training course for community activists on subjects including family planning, preventive health, nutrition, hygiene, and gardening. These activists organize by lanes and have weekly meetings which are also used for service delivery at cost. Women are eager to learn and pay a nominal fee to attend meetings.

An important innovation is that OPP relies on capacity building of local community members rather than on social organizers from outside the specific community. The advantages are that the women have confidence in the local activists and that through them OPP is able to reach a much larger audience. While women are left to make their own decisions, based on full information, the activists play a critical role as catalysts, providers of information and facilitators in service delivery.

Contributed by Tariq Banuri

Given all the benefits listed above, is participation universally desirable? Could any problem arise? The management of a conservation initiative may wish to take into consideration the following potential issues and constraints:

- Full local participation and empowerment are best developed in a democratic society. Yet, several communities affected by conservation initiatives are highly hierarchical in nature and generally follow the decisions of their leaders. In those communities, the participation of certain disadvantaged groups may clash with local customs (e.g., the participation of women, the landless, ethnic minorities, etc.).

- The very concept of ‘stakeholder participation’ may be quite alien to some cultures and groups. For instance, it may be that the self-assertion required to express one’s ‘stake’ (which differs from the ‘stakes’ and interests of others) is considered unseemly and clashes
Box 3.2

The ambiguity of participation

The current widespread interest in people’s participation in environmental and development programs surely derives from the impressive benefits that participation is expected to bring. It also derives, however, from a certain ambiguity of the concept itself. Its possible interpretations (which also reflect alternative interpretations of the concepts of development and democracy) span from participation ‘as a means to facilitate and improve external interventions’ to participation ‘as an end in itself’.

If local people participate, they are willing to contribute local resources: this is the basic rationale for promoting participation ‘as a means’. For instance, people participate when they provide free labor for a local construction, free or low-cost lodging and food for external workers, or needed land, timber, building materials, animals, water, etc. From this point of view, participation regards only the people who are involved in specific activities in a given period of time. The phenomenon is relatively easy to monitor and evaluate.

The rationale of participation ‘as an end in itself’ is more lofty, and its practice and evaluation are more complex. People participate when they take an active role in planning, deciding, implementing and evaluating initiatives. In this process, people – and in particular the poor and disadvantaged – end up organizing to overcome problems and to gain more control over their local environment and livelihood. Thus, seeking participation aims beyond the horizon of a specific initiative. A main indicator of success is the development and strengthening of local organizations, which can represent people’s interests and concerns long after a specific initiative (e.g., a project) ceased to exist.

The above views can appear incompatible, but, as often happens in real life, specific people in specific contexts end up being more influential than ideological approaches in determining results. At times, participation promoted for the sake of savings and work efficiency has seeded a major development of local awareness and concern. On other occasions, well-intentioned agencies never managed to arouse the interest of local people for their own ‘development’ and/or ‘empowerment’.

with accepted behavioral norms. In fact, the participation of various stakeholders presupposes that different interests exist within a community, which is a concept largely derived from the economic and cultural context of modern western society.

- National governments may not support local participation or empowerment, especially if they regard it as a threat to their own authority, or as an encouragement to opposition groups. The participatory approach also may not be viable because of local political opposition or sheer lack of norms and institutional support.

- Participatory processes require specific investments of time and resources. In particular, the process of participation needs expert facilitation and clear objectives, to avoid chaotic meetings and a general loss of direction for the initiative. The needed resources may not
be available or the relevant activities may not have been foreseen in the original plan of the conservation initiative. In these cases, creativity and managerial initiative are necessary.

- Participatory approaches require commitment over time and results may take a while to appear. This can tax the patience of donors, managers, staff and local people alike. Threats against natural resources may be escalating, and the urgency of taking action may discourage people from undertaking lengthy participatory processes.

- Time and resource investments may be required to reach a good level of communication between the local people and the national or expatriate staff in the conservation initiative.

- Some compromises in conservation objectives may need to be made. For instance, a conservation initiative designed by outsiders may propose a total ban on local access to natural resources, which may be simply unacceptable to the locals. Also, emphasis on the process of participation may take attention and resources away from the 'technical content' of the initiative.

In short, participation requires time and effort, not to mention additional resources and socio-political sensitivity. But the rewards, in terms of the sustainability of project interventions, local empowerment and promotion of democratic processes, can more than make up for the costs and potential frustrations encountered.

...national governments may regard participation as a threat to their own authority, or as encouragement to opposition groups...
3.2 Participatory project management

In participatory project management two frequent practices are usually called into question:

- the top-down decision-making process;
- the ‘blueprint’ approach to project planning and implementation.

Many, if not most, of the existing development and conservation initiatives around the world are the result of top-down decision-making processes. What is to be done, as well as how, where and when it will be done, is decided by agencies from outside the local community. Institutional desires and the wishes of ‘well-meaning’ outsiders carry more weight than the felt needs and know-how of local actors. Even when local participation is actually pursued, the rhetoric of program documents may talk about the ‘poorest of the poor’, but those who are consulted are usually local leaders and prominent people.

In addition, the administrative needs and bureaucratic rules of donors and implementing agencies pressure development and conservation initiatives into standard (conventional or normative) project documents. These documents contain rigid sequences of outputs and activities (so-called ‘blueprint’ plans), based on forecasting which may have been fixed even before a preliminary contact with the local community has taken place. Despite their coherent and meaningful appearance, these project documents do not usually survive the reality of implementation. Delays, deviations, unforeseen constraints, incidental events, unexpected outcomes and missed opportunities are the daily lot of many conservation or development initiatives. Unfortunately, in the usual development and conservation practice, a written project document is more important and more ‘real’ to the funders and supervisors than a project in the field. Requirements for delivery of inputs and production of outputs, as stated by the project document, are a straitjacket for project managers and communities, preventing them from creatively exploring alternative courses of action based on what they learn during project implementation.

To overcome these limitations, some development and conservation agencies have started to experiment with a new project management style, which is based on the following:
• **Flexible and relatively open-ended project documents.** Lists of objectives, outputs and activities are presented as an open set of alternative courses of action. Their relevance to local needs and resources is to be field-tested and validated, with the active involvement of local actors, at the start-up of the project and during its lifetime. Selection within this list, as well as reasonable shifts from the initial plan, is foreseen at any time of the project. Consequently, timing, delivery of inputs and achievement of results are left as open-ended as can be acceptable for the donor and the implementing agency.

• **Field-based participatory appraisal, feasibility analysis and strategic planning.** Whatever the general objectives of the initiative are, time and resources are allocated for carrying out a preliminary appraisal and feasibility analysis with the full involvement of local actors, i.e., a participatory baseline assessment. This exercise usually leads to lists of problems and possible solutions as perceived by different groups of local persons. Planning decisions are eventually made by collectively negotiating these lists against the mandate of the external agency and the policy priorities of other local institutional actors. It is only on this basis that a detailed short-term plan and timetable is prepared.

• **Participatory implementation and monitoring.** The responsibility of carrying out decisions negotiated through participatory planning is shared by the different actors involved, such as community groups, local authorities, NGOs and external donors. Each actor is supposed to contribute its own resources (e.g., knowledge, skills, raw materials, technical inputs, financing) to implement the common plan. Due to the variety of actors involved and the flexibility of planning decisions, continuous monitoring by all the concerned parties becomes an important component of implementation. The monitoring helps to control the flow of inputs and the deployment of activities, as well as to identify and settle conflicts and problems which may arise, and to take advantage of opportunities as they come.

• **Participatory evaluation and re-planning.** The open-ended and iterative (i.e., repeating cycles) orientation of the participatory process means that on-going evaluation is essential. In contrast to summative evaluations that decide whether to continue a project or not, evaluations in participatory processes generally have a ‘formative’ focus. Their aim is to extract lessons learned during the implementation and
The power of the center: a view on participation in Africa

A strong tradition of centralized planning and administrative control has taken hold in Africa. In the post-independence era, forging a single national identity from different political, religious and tribal backgrounds was an overriding priority for most young governments. The prospect of independent power centers was perceived as a threat to central authority and, by extension, to national unity. As such it was aggressively discouraged.

Centralized authority has become an established way of life. Even most ‘decentralization’ plans have merely shifted authority to surrogate administrators located in provinces or regions. The slightest sign of independence or autonomy is often dealt with quickly and harshly. It is not surprising that an attitude has emerged whereby rural people believe that the lead in development activities should be taken by recognized authorities.

Correspondingly, an atmosphere of passivity and dependence prevails in rural communities. Local initiative, when taken at all, has evolved into a dismal shadow of its true potential. People have become accustomed to petitioning those in authority, or donors with outsider resources, to do something on their behalf. That reinforces a self-perception as submissive objects of development rather than active players. The result is predictable: with a shrug of the shoulders, many villagers spend a lot of time waiting for development to happen through the efforts of others and point accusing fingers when it doesn’t take place.

Some political authorities, of course, do teach the need for self-reliance and thereby give at least some rhetorical encouragement for local participation. This often takes the form of half measures, of enlisting people to supply labor or make financial contributions to projects that have already been decided elsewhere. When the recurring demands for labor or money are high and associated with a low perception of personal benefits among the villagers, there will be little participation and projects will fail.

Unfortunately, many attempts at locally initiated rural development projects do fail. Rural people often have limited organizational and managerial skills. This not only makes them vulnerable to intentional mismanagement and theft, but also contributes to inadequate planning. Self-help projects are easily frustrated by inability to analyze problems and formulate simple solutions. When such failures occur, the negative experience goes a long way to discouraging similar initiatives in the future.

From: Bergdall, 1993

use them to guide the future evolution of the project. Re-planning of each ensuing activity or phase is thus an expected part of such evaluations, in order to continuously learn from the previous experiences.

The new project management style entails several technical difficulties. Repeating (cyclical or iterative), open-ended and comprehensive processes are much more complex to manage than pre-defined one-time
Box 3.4

The power of the villages: another view on participation in Africa

Can the pattern of ‘local passivity’ be broken? Can traditional and new knowledge and skills be harnessed for the good of local communities?

The Naam groups of Burkina Faso, West Africa, are illustrative of traditional participatory structures that have been adapted and updated to fit current circumstances. Called Kombi-Naam in the local Mooré tongue, they were, until a few years ago, traditional youth associations, composed of girls aged 15 to 21 and young men of 20 to 35, with the purpose of both developing moral qualities such as solidarity, cooperation, friendship and loyalty in the young, and at the same time accomplishing socially useful tasks for the village. Positions within the Naam were not at all based on caste or social status, but rather on ability. The Kombi-Naam traditionally provided moral, civic and technical training for the village youth.

Through the tireless work of Bernard Ouedraogo, a teacher turned agriculturist, Naams were adapted for the purposes of modern development. The transition from the traditional to the modern Naam was gentle, enabling village groups to adapt little by little to their new roles. One important change was the opening up of the Naam to people of all ages, thereby involving the whole village rather than just one age group. The modern Naams also nominate counselors from among the village elders, an innovation in line with the African tradition of respect for the wisdom of the elders. The Naams are primarily involved in village agricultural development, but they also work in income-generating activities.

In the late 1980s there were over 4,000 Naam and affiliated groups in the Yatenga area of Burkina Faso, with well over 200,000 members — unquestionably one of the largest, most powerful peasant organizations in Africa, and a formidable force for development. The Naams represent the triumph of the idea of ‘developing without harming’.

The Naam is a form of development adapted to local needs, created by the people themselves, which instead of destroying traditional structures from the outside, slowly, like leaven, transforms them from the inside. It starts from where people are (based on a true appreciation of their African identity), what they know (respect for traditional knowledge and values), their know-how (rediscovery of traditional techniques, some of which, for example in the field of water and soil conservation, have proven invaluable) and what they wish to achieve (which implies meaningful grassroots participation in defining the very objectives of the development process).

Adapted from: Pradervand, 1989

Interventions in a single sector. Engaging full participation calls for effective means of communicating, building consensus among different actors and, whenever needed, helping them to solve their conflicts. Important goals in potential opposition, such as the exploitation of natural resources for economic development and their conservation for future gains and ecosystem functioning, need to be composed and harmonized. Working at the local level is possible only if the political and
economic links with the national and international situation are acknowledged and strategically managed.

To meet these challenges, the professionals working with initiatives aimed at participatory and sustainable development have looked for new and appropriate technologies for project management. Various participatory methods for information gathering and assessment, planning, implementation and evaluation have evolved in response to this demand. In the following sections, we shall refer broadly to this growing family of methods and tools as 'participatory action research'.

**Partnerships between local and non-local actors**

The process of responsible and informed decision-making at community level about environment and population issues can become more effective by merging local knowledge and resources with external skills and inputs. This is the justification for establishing a partnership between local actors (community members and institutions) and non-local professionals with the aim of improving quality of life in the community and optimal management of its natural resources.

Ideally, such partnerships are based on the following principles:

- **Mutual respect.** People from different backgrounds and social realities seem to live in different worlds. Yet, if one is open minded, tolerant and respectful, meetings of this kind can be among the most rewarding events that life can offer.

- **Complementarity of capacities.** Most often, local and non-local actors have diverse comparative advantages and skills, which can complement one another and at times develop into true synergies.

- **Working for a common goal.** At best, collaboration develops on the basis of a shared vision of what is appropriate and desirable in a given context. When particular benefits and interests merge into a mutual goal, all parties are more motivated to act. (This said, even a good compromise, merging different goals of different partners, can be at the basis of a successful partnership.)

- **Process orientation.** A collaboration is best considered as an organic and evolving phenomenon, rather than a way to produce a project plan that will stand forever. Partners should feel that agreements can be changed, but they should respect them as they stand until all interested parties agree to modification.
Case Example 3.2

When participation succeeds...

North of New Delhi, in the Indian state of Haryana, are the Shivalik hills, an ecosystem of luxuriant broad-leaved and coniferous vegetation. Unfortunately, since the middle of the last century these hills have suffered from wrong policies and unchecked resource exploitation, in particular of timber and grass. Watershed erosion became so persistent and severe that the topography of the region was profoundly affected. Deep gullies carved the denuded hills while the lakes and reservoirs downstream slowly filled up with fertile silt and sediments.

The Haryana Forest Department attempted to stop this destructive process by constructing check dams, palisades and silt detention structures. It even erected barbed-wire fences around the areas to be protected and reforested: all attempts were frustrated. As soon as the stones and wooden posts used to build the check dams and palisades were in place, local villagers removed them for their own domestic use. Within days of setting a fence, passages were opened to allow access for goats and cattle to what was left of the hillside pasture. It was a battle with no end and no winners. People and foresters fought one another while the environment worsened and the communities got poorer and poorer.

The villagers of Sukhomajri were major contributors and victims in this state of affairs. In the late seventies, after the latest baffled attempt at fencing a severely degraded area, a concerned forestry officer pleaded with the people that they stop grazing and foraging the watershed. The villagers replied they were ready to do so, but only if alternative means of survival could be found, since they were hopelessly dependent on the hills for fodder and fuel.

The solution was found in capitalizing on a previously unused resource: rainwater. Until then, rainwater had been simply left to run downstream with its load of fertile soil. With some outside support, the people of Sukhomajri constructed a small earth dam above a gully head, thus collecting rainwater that could irrigate the village. Irrigation led to a dramatic increase in local crop yields and provided a strong incentive to maintain the supply by protecting the watershed. The impounded water was distributed equally, irrespective of land ownership, meaning that some could use it directly, and others could sell it: everybody shared in the common interest. Slowly but steadily, the number of goats raised locally decreased, and the number of stall-fed buffaloes and the local milk production increased.

A village society was formed and soon assigned responsibility by the Forest Department for protection of the forest. The society built contour trenches to improve the moisture regime in the hills, planted local tree species and sowed bhabbar grass. The grass provided excellent fodder, which was hand-collected and sold following the society's own rules to equally benefit all village households. Soon, another check dam was built near Sukhomajri. By the early 1980s, the Haryana Forest Department had become the leading agency in building dams, providing communities with grass leases and helping to organize management societies in the villages of the Shivalik hills. The barbed-wire fences could be completely removed: people's participation had successfully replaced them with much more effective 'social fencing'.
3.3 Participatory action research: general features

Growing from experiences in applied research in the social sciences, community-based development and participatory project management, participatory action research (PAR) (see Box 3.5) has been used widely around the world. For instance, PAR has been applied to plan, implement, monitor and evaluate many kinds of projects, such as community organization and development, community health and nutrition, agricultural extension, community forestry, urban environmental improvements, education and training, etc.

Many variations on the theme exist. Some of the better known examples include: rapid rural appraisal (RRA), participatory rural appraisal (PRA), rapid assessment procedures (RAP), activist research and farmer participatory research. While there are differences in emphasis, orientation and sector of application for these methods, all of them share some common features which allow us to group them under the label of ‘participatory action research’. Such features include:

Local focus:

- **An orientation towards the felt needs of local people and institutions.** PAR deals with issues directly experienced and explicitly acknowledged as problems by local people and institutions.

- **A strong link with locally generated initiatives.** PAR aims at generating information and supporting decision-making processes useful for local aims and applicable to local initiatives.

- **The involvement of non-local actors as partners in a learning process.** When non-local actors are involved, they contribute to PAR via discussions and negotiations with local actors.

Action focus:

- **A minimal time-gap between data collection, analysis and feedback.** Timeliness of analysis and rapidity of feedback are sought, to increase the cost-effectiveness of the research and promote the practical use of its results.

- **A direct feeding of research results into planning and action.** PAR goes beyond ‘recommending’ changes based on the findings (as often happens with conventional research). The action research process incorporates methods for translating the knowledge gained directly into practical decisions and/or feasible courses of action.
A view on participatory action research

An important concern among the early developers of participatory action research was the need for integrating understanding and practice. Here are some thoughts from Lewin, one of the pioneers of action research.

1. Action research is intended to contribute simultaneously to basic knowledge in social science and to social action in everyday life. High standards for developing and testing theories are not to be sacrificed, nor is the relation to practice to be lost.

2. Action research, like social management more generally, involves iterative (repeated) cycles of identifying a problem, planning, acting and evaluating.

3. Action research typically involves change experiments on real problems. It focuses on a particular problem and seeks to provide assistance to solve it.

4. The social change desired by action research generally affects the patterns of thinking and acting that are presently well established in individuals and groups. The intended change is at the level of norms and values, and it is expressed in action. Effective change, in this sense, depends on participation by ‘clients’ in diagnosis and fact-finding as well as having free choice to engage in new kinds of action.

Adapted from: Argyris et al., 1990

Process focus:

- An equal concern for process and results. PAR consists of collecting ‘fairly quick and fairly clean’ information, but it doesn’t stop there. It also aims at making all participants aware of the implications of the issue (problem, situation, etc.) being investigated and supporting them in undertaking relevant action.

- A built-in communication strategy. While final written reports are useful for institutional or training purposes, meetings and workshops are the most important means to provide feedback to local institutions and the community at large.

- The re-definition of the role of non-local professionals. Non-local professionals are expected to leave behind their attitudes as ‘experts’ and to act more as providers of views and information that need to be evaluated for appropriateness and usefulness by the local people. At times, they may serve more as facilitators than experts. Precision and accuracy of findings are balanced by the timeliness and user-friendliness of research and decision-making techniques.
3.4 Participatory action research: basic methods and techniques

Participatory action research includes an increasing array of techniques and tools designed for dealing with a variety of management issues and problems. For simplicity of presentation, all of these techniques can be brought back to three basic methods for generating information and making decisions. These three methods, which have been widely used and tested by applied social science, are: participant observation, individual interviewing, and facilitated group meetings and exercises.

**Participant observation**

Participant observation consists of taking part in social situations with the aim of discovering issues, events and interactions which may be obvious for the local actors but unknown to the external observer. Extensively used by anthropologists, participant observation has proved to be especially useful in the framework of participatory action research for:

- understanding the way in which local people use natural resources and manage their environment;
- understanding the local social environment, with special emphasis on status, roles and behaviors related to gender, age, wealth, social status and ethnic differentials;
- understanding the daily relationships and communication flows existing among non-local professionals (e.g., project staff) and different groups of local people;
- analyzing daily, weekly, monthly or yearly patterns of activities and the time allocated by local actors to perform them.

As used in conventional anthropology, the technique of participant observation typically entails a regular routine of being there – taking notes, reflecting, hypothesizing and making many repeated observations for confirmation. Such a time-consuming procedure does not usually fit well the practical needs of participatory action research. While failing to provide the in-depth understanding of local society and culture which comes after several months of full-time participant observation, a few days spent walking around and visiting people and places with an open mind are a good entry point for a professional new to a particular community or project setting. The discussion of insider/outsider experiences in the participant observation method is a key component of any action research process (see Box 3.6).
Box 3.6

The insider/outsider experience

The ordinary participant in a social situation usually experiences it in an immediate, subjective manner. We see some of what goes on around us; we experience our own movements; we move through a sequence of activities as subjects, as the ones engaging in the activities. In short, we are insiders. Our experience of participating in a social situation takes on meaning and coherence from the fact that we are inside the situation, part of it. The participant observer, on the other hand, will experience being both insider and outsider simultaneously.

From: Spradley, 1980

To get the most out of a rapid participant observation of a local setting, PAR practitioners tend to focus this practice on situations directly relevant to specific issues of interest. For instance:

• transect observational walks (see Annex B, section B.1): walking with one or more residents across the area surrounding a village can be useful for obtaining information about patterns of natural resources and their exploitation or use;

• visiting places where different community groups meet: people tend to gather in places like markets, coffee shops, football grounds, religious buildings, water source points (boreholes, springs), etc. Observations can be made at such locations to identify patterns of social interaction among different groups;

• attending official meetings and ceremonies (if possible and acceptable): observing at events, such as community meetings and ceremonies can generate insights about the political and social dynamics in the community;

• observing service delivery and project activities: many kinds of services are provided in communities; observing the process can help in assessing the reciprocal attitudes and behaviors of providers and users. Traveling along during regular project activities, such as agricultural extension visits, natural reserve patrolling or family planning outreaches is a very good way to understand the communication flows between external agencies and local people. While it is desirable to remain neutral relative to either the project or the community, assisting with some simple tasks during the activity is generally appreciated by staff and recipients. In this way, participant observation can lead to closer rapport and good opportunities to engage in discussions with local people, service providers and project staff.

In most observation sessions, note-taking is appropriate and necessary. Jotting down what has been observed is not only an aid for memory but also a way to focus the observer's attention on issues directly relevant to
the problem(s) for which the action research is being done. Pre-set observational check-lists can be used, but they are more controversial. The advantages – standardization and systematization of observing specific items – will need to be weighed against the risks of losing an open-ended, discovery-oriented and relaxed approach which is a basic strength of participant observation.

As mentioned earlier, participant observation is usually combined in action research with various individual interviewing and group discussion techniques. Indeed, verbal interaction on the spot, i.e., talking with the people who happen to be there, can help to elicit insider interpretations of an observed behavior, event or situation. Most importantly, as PAR is principally for the benefit of local people, any observation collected by outsiders needs to be communicated to the insiders and discussed/evaluated together with them.

**Interviewing – for qualitative and quantitative information**

Interviewing is basically a process of inquiring into another person’s perceptions about a particular issue (or set of topics). It can include exploring their knowledge, feelings, attitudes, opinions, past experiences and expectations for the future.

Interviewing can be useful for a wide range of concerns, such as:

- local knowledge of the natural and social environment: natural resources available and their traditional use; local technologies; means to mobilize labor; social organization of the community; gender and age issues; etc.;
- felt problems and needs: related to household economy, conservation of the resource base, education and health; access to reproductive health, family planning, credit services, etc.;
- perception of existing initiatives in the area (e.g., conservation or development projects): relationships among local actors and staff; relevance of the initiative to local needs; functioning, acceptability and appropriateness of the services provided; etc.;
- time trends in the life of the community: effects of seasonality on social life; distribution of activities throughout the year; local history; life histories; expectations about the future; environmental and population coping strategies in the past; etc.
Two main interview approaches are used by social researchers: open-ended and closed-ended interviewing. **Open-ended interviews** are based on a more or less organized and standardized sequence of questions whose answers are richer than a plain 'yes' or 'no' statement, a numerical figure (e.g., 15 years) or a categorical judgment (e.g., 'good' or 'bad'). As with participant observation, open-ended questions aim at discovering elements of the insiders' perceptions of the topic under investigation, which are likely to be almost unknown to the interviewer. Open-ended interviewing is thus a powerful means to catch 'qualitative information'. Widely used in anthropology, psychology and other traditions of applied qualitative research, open-ended interviewing is a key component of participatory action research (see Annex B, section B.6).

Choosing the proper respondents is an important element of open-ended interviewing. Some respondents could be selected because they have special knowledge about the topic of the action research – they are **key informants**. It also helps if they are ready to talk and they are somewhat reflective or analytical in their thinking. Other respondents might be selected for their representativeness as members of different interest groups, or on the basis of any special social status accorded to them, either formally or informally. Open-ended questions can also be addressed to a group of respondents. Groups may be spontaneously set up (e.g., a natural group of peasant women encountered while they are at a spring for water) or convened by the interviewer (e.g., a focused discussion group or **focus group**).

Most often, the sampling of respondents for open-ended interviews is based on judgmental (purposeful) criteria rather than random chance. Such purposeful sampling is quite different from the random sampling useful to draw statistical probabilities in quantitative research. Statistical sampling is based on randomness so that researchers can confidently generalize results from a small sample to a larger population. The power of purposeful sampling lies in selecting information-rich cases for in-depth analysis related to the central issues being studied. A list of different sampling strategies that can be used in qualitative action research (either for individuals or groups) is presented in Box 3.7.

The success of an open-ended interview depends very much on the communication skills of the interviewer, which are needed to keep the discussion as a relaxed dialogue. These skills include helping the interviewee...
Choosing a sample: purposeful sampling in qualitative research and evaluation

There are several different strategies for purposefully selecting information-rich cases; the logic of each strategy serves a particular research purpose.

1. **Extreme case sampling**: focuses on cases that are rich in information because they are unusual or special in some way (e.g., the only community in a district that has prohibited pesticides).

2. **Maximum variation sampling**: aims at capturing and describing the central themes or principal outcomes that cut across participant or program variations (e.g., persons of different ages, genders, religious groups and marital status in an area considering family planning interventions).

3. **Homogeneous samples**: picking a small sample with similar characteristics to describe some particular sub-group in depth (e.g., firewood cutters or charcoal makers in a specific area).

4. **Typical case sampling**: using one or more typical cases to provide a local profile. These cases (individuals, families/households, communities, etc.) are selected with the co-operation of key informants, such as program staff or knowledgeable participants, who can help identify what is typical.

5. **Critical case sampling**: looking for critical cases that can make a point quite dramatically or that are, for some reason, particularly important in the scheme of things (e.g., the life history of a poacher).

6. **Snowball or chain sampling**: begins by asking people in the program: ‘Who knows a lot about…? Who should I talk to?’ By asking a number of people who else to talk with, the sample gets bigger and bigger. Useful for identifying specific kinds of cases (e.g., critical, typical, extreme, etc.).

7. **Criterion sampling**: reviewing and studying all cases that meet some pre-set criterion of importance (e.g., the economic strategies of women-headed households).

*Adapted from: Patton, 1987*

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(respondent, participant) feel at ease, phrasing questions in clear but not leading ways (i.e., not suggesting the ‘correct’ or ‘expected’ answer, as in the question ‘Do you believe conserving natural resources is good for your community?’), and introducing probing questions appropriately (e.g., asking for further details when respondents give general answers).

Confidentiality can be an issue for some participants. Although the potential topics for interviews mentioned earlier in this section are not generally very sensitive for most individuals, the nature of the interview process, especially qualitative open-ended interviewing, can result in respondents disclosing information which they would prefer to keep confidential (i.e., they want the information revealed but not the source of the information). It will be important for the interviewer to respect such wishes if they arise.
Open-ended interviewing techniques are best carried out with detailed note-taking aimed at catching the exact words and phrasing of respondents’ answers (i.e., quotes, verbatim statements). Tape recording can be of great assistance in this effort, but only where and when it is fully acceptable to the respondent.

Once data are collected, good summarizing skills and insight capabilities are needed to extract meaningful content from the statements provided by respondents, which at times can be long and wandering. The latter task can be facilitated by the use of qualitative analysis matrices (see Table 4.7, p. 136).

The qualitative information provided by open-ended interviews of individuals or groups is often counterchecked and completed by other methods and techniques, including participant observation and closed-ended interviewing. This is especially important when it is desirable to assess the generalizability of the data for a larger group of people than the small numbers directly interviewed.

**Closed-ended interviews** use carefully organized questions which allow only a limited range of answers, e.g., a yes/no answer, a categorical answer (male or female, peasant or herder, etc.), a preference answer (‘A is better than B’, etc.) or an answer expressed by a number (age, date, time, distance, land measurements, etc.). The series of questions in this type of interview are usually presented with **structured questionnaires**. These are pre-set formats in which the interviewer marks responses against a given group of possible answers for each question. To allow generalizing from these kinds of results, different statistically random sampling procedures are at times used to select the respondents, with the aim of interviewing a **representative sample** of the population under study.

In applied social sciences, such as demography and epidemiology, structured questionnaires are widely used for collecting quantitative data (i.e., data which can be processed by means of arithmetic and statistical formulas). Many research practitioners share a critical view of rural surveys which are solely dependent on questionnaires (see Box 3.8).
Box 3.8

A critical perspective on questionnaire surveys

In 1973–4, I collaborated in a large questionnaire survey in Tamil Nadu. Since I was responsible neither for the training of the investigators who conducted the interviews, nor for the supervision of the survey, it is not immodest to say that the survey was well supervised, and the investigators were well trained and keen. There were eight investigators for 12 villages, each of which differed sharply from the other 11. Four investigators had only one village each, but the other four each had two villages.

On the basis of the survey data, I wrote an article on agricultural extension, and intended to submit it for publication. But the more I looked at it, the more I sensed something was wrong. Eventually I took the results from the eight shared villages and paired them by investigator. The results from each village were more like those of its pair, shared by the same investigator, than like any other village. It seemed likely that the main independent variable was the investigator; and the basis for the article collapsed.

By occurring in a well-supervised survey, this experience throws into question the credibility of other surveys which do not test for and report on individual interviewer bias. Few do. And the fact that the literature about this kind of bias is so sparse may reflect that even those who do carry out tests have sinned as I sinned in holding back from publishing the damning findings.

More generally, critical discussion of methodological problems so rarely accompanies publications of survey results that the validity of the findings of much of the survey industry is open to question. For our purposes here, the conclusion is that the quality of data from questionnaire surveys is often so poor that an improvement is not difficult to achieve.

From: Chambers, 1992

Two major complaints about questionnaires relate to the loss of human touch and the extent of technical expertise required. Structured questionnaires are often poorly understood by respondents and there are problems with the reliability of the information collected. Moreover, carrying out high-quality quantitative surveys requires specialized skills for questionnaire design, as well as the capacity to cope with the sophistication and abstractions of statistical analysis.

PAR, however, may also need quantitative information (such as the data provided by a population census or a demographic survey). In other words, it may require a blend of qualitative data about the nature of a problem or a situation combined with quantitative data about the distribution or extent of the problem to ensure a full and reliable analysis of a given situation.

To meet these needs, PAR can indeed **combine** qualitative and quantitative methods. This can be done sequentially, e.g., by doing open-ended interviews first to assess the range and nature of responses, fol-
allowed by closed-ended questionnaires to check on the prevalence and distribution of responses. Semi-quantitative and participatory methods of ranking (see Annex B, section B.8) can then help individuals and groups of respondents to express judgments and opinions about the results of a questionnaire. Discussions of specific findings can also be held with groups which are representative of specific social actors, interests and/or the community at large. These discussions can focus on the interpretation and validity of the findings derived from questionnaires.

**Facilitating group meetings and exercises**

Participant observation and individual interviewing are powerful ways to elicit information about a local social setting. The action research approach, however, does not stop at this point. As soon as possible, the ‘research’ interaction needs to become a partnership among local and non-local actors (community groups, local institutions, project staff, etc.) aimed at taking action – if action is due – on the basis of the research findings. The basic method which enables this to happen is facilitated group work (see Annex B, section B.14).

Participants for action research group exercises can be recruited through purposeful sampling strategies, such as those employed for open-ended interviewing. Another strategy is to use spontaneous clusters of community members on the basis of a common interest, e.g., women farmers, herd-boys, water vendors, traditional birth attendants, etc. Such natural groups – which often coincide with, or can lead to identify, specific interest groups – are actually the core actors of the PAR process.

Frequently, members of interest groups will already be participating in the organized or informal indigenous social groups that are typically found in most rural communities, e.g., farmers’ groups, burial societies, self-help groups, mothers’ unions, revolving credit clubs, etc. A core concern of many of these social groups is mutual aid or assistance. At times they constitute themselves as community-based organizations to support the socio-economic and environmental interests of their individual members or of the community as a whole, e.g., as a user group, a local cooperative, a village council, a residents’ association, etc. Where such groups exist, they are very important actors to involve in assessing the local environmental and social situation and in planning some initiatives to ameliorate it (see Box 3.9).

*PAR may require a blend of qualitative data about the nature of a problem combined with quantitative data about the distribution or extent of the problem*

*specific interest groups are the core actors of the PAR process*
Examples of community-based organizations

The engozi groups of south-western Uganda

Engozi societies are clusters of 10–20 or more families that collectively raise funds to purchase and maintain an engozi, a traditional stretcher made of vines from the local forest and carried on poles, used for transporting ill or pregnant persons to a health facility. All members of the society participate in providing this effective health transport in a mountainous area poorly served with roads, e.g., by carrying the stretcher, providing food to the carriers, etc. Paid-up members of the society are carried for free; others may be charged a fee. In some societies, additional funds are raised through various activities to support loans among their members, e.g., for health expenses like drugs and doctors’ fees.

The zanjerás in the Philippines

Traditional associations in the Philippines called zanjerás aim at assuring adequate and consistent delivery of irrigation water to all their members. The zanjerás distribute water rights and labor duties (e.g., for maintenance and repairs) proportionally to land ownership by way of the atar system (for instance: owning 1 hectare of land = 1 atar = receiving the water needed to irrigate 1 hectare + providing 1 day of labor per month). The zanjerás can earn income by selling water to non-members, and usually this income goes to cover maintenance costs of the irrigation system (cement, construction supplies, tools, food for the workers, lawyers’ fees, etc.). Many zanjerás have been in operation for more than two centuries. They allow for proportionality of costs and benefits of communal work, and for remarkable ease and flexibility of accounting procedures (e.g., when land is subdivided and the new owners share among themselves water and labor duties).

Action research practitioners rely on a large selection of techniques and tools to promote participatory appraisal, planning, monitoring, evaluation and re-planning among the members of interest groups. They include group exercises that focus on:

- collection and organization of information owned by different local and non-local actors;
- discussion and validation of information collected in the field or from existing secondary sources (e.g., census, official statistics, technical research);
- building consensus, resolving conflicts, setting priorities and making decisions;
- learning by doing during the implementation of decided activities.

Experience has shown that group work with local actors is more likely to be effective and efficient when a neutral and coherent facilitation is provided by an experienced person who is not a member of the community. A good facilitator helps the participants to think and communicate with one another, and avoids imposing his/her personal view or suggesting the 'right' answer or decision either explicitly or implicitly. He/she
takes care of helping the group achieve the results the group itself wishes to achieve, managing interpersonal dynamics, ensuring that the discussion is kept on a relevant track, and keeping the length of the exercise within reasonable limits.

To carry out this role, the facilitator needs a good understanding of the social and cultural reality of the participants. This awareness is essential so that his/her personal style can be adapted to the rules of behavior, the communication and analytical skills and the cultural attitudes of the participants. A good facilitator will be able to strike a balance between the need to achieve some positive results in the group work and the need to keep the interaction among participants as smooth and relaxed as possible. Maximizing the contribution of each participant in the group exercise, settling conflicts and building consensus are the facilitator’s main responsibilities (see additional details about facilitation in Annex B, section B.14, and in Chapter 5).

As part of skillful and non-intrusive facilitation, the creative use of visual aids is an important strategy for supporting group exercises in action research. Some examples of visual techniques include the following:

- Maps and transect representations can be used very effectively in groups to describe and analyze the community’s spatial distribution of features of special interest (e.g., natural resources, types of soil, vulnerable families, types of services, water points, land tenure patterns, etc.).
- Drawings, posters, pictures and slides as well as open-ended stories, popular theater and community-directed videos can be an excellent entry point for group discussions.
- Sorting, counting and ranking exercises may be done in written form but, if literacy is low, they can equally be carried out with everyday objects, such as seeds, stones or simple sketches on small slips of paper.
- Graphic representations by means of pie charts or bar charts (or better yet pictograms, i.e., graphs built of pictures) are suitable for conveying quantitative information even to non-literate participants. The pictograms (whose shape is often inspired by daily objects such as trees, animals, pottery or food) can be used to describe and analyze...
time trends, patterns of relationship among different actors, or sequences of causes, problems and solutions.

- Analytical tools (e.g., matrices, problem-cause-effect trees, Venn/chapati diagrams – see Chapters 4 and 5) can be used to organize and analyze findings, including qualitative statements. They can also be used on flipcharts or chalkboards for assembling the ideas developed in a brainstorming session with a group.
3.5 Participatory action research: conditions for success and problems of validity

Participatory action research can provide effective support to any conservation or development initiative. Though based principally on common sense, PAR exercises have some pre-conditions, and entail several potential technical and attitudinal difficulties that are addressed in this section.

Community acceptance
An underlying assumption of the PAR approach is that the people in the community are willing and can afford to invest energy and time in the process. Another assumption is that the non-local partners and facilitators in PAR have the trust and confidence of the local community. This kind of trust is not developed overnight, and in some cultures it develops only over months, and perhaps years, of working together.

It is unrealistic for people unfamiliar with a community or the local context to have the kind of understanding and local acceptance necessary to become partners or facilitators in the PAR process. Therefore, it would be advisable for at least one or two of the non-local support team to take the time to get to know the community and build rapport with community members. Generally, this will mean either living within a community for a period of time, or maintaining contact with the community through regular visits. This contact could be on the basis of regularly scheduled meetings (e.g., those carried out by health workers or agricultural extension agents) or on the basis of a long-term conservation or development initiative that require frequent visits to the community for coordination. Once trust is established, it is far easier to collaborate with community members in PAR or any other activity.

To enable those non-local partners who have not had extensive contact with the community to get to know community members and vice versa, it may be useful at the outset of a PAR to engage in some kind of ice-breaking activity. For example, the non-locals might participate in traditional village tasks such as gardening, construction or clothes washing. This can serve to build rapport while at the same time helping community members to see that they possess a unique body of knowledge and skills not necessarily shared by outsiders. It may also help the non-local partners to address their work with more humility.

Staff technical know-how and attitudes
After taking the initial decision to adopt participatory action research (e.g., at the start of an initiative or to re-orient an existing project), some
specific know-how can be transferred to its staff via training by an experienced practitioner. Regional and sectoral networks of concerned institutions may provide technical assistance and open fora for discussion and exchange of experiences. Learning materials in different languages – this manual being but one example – are also available (see the References section for recommended reading on PAR and PEC).

The availability of qualified support and literature alone, however, cannot ensure the deeper attitudinal change that the practice of action research demands from project managers, conservation and development professionals and field workers. While this change usually occurs spontaneously in the process of field experience in participatory action research, it can be facilitated by attention to a number of general cognitive and behavioral points:

- **Knowledge is for the community, not for the non-local partners.** The most important objective of action research is to strengthen local abilities to seek, organize and utilize relevant information to solve problems. Participatory exercises are not the time or place for academically oriented research. Collecting data in a participatory way may be initially greeted with interest, but later resented by the community as a waste of time if the results are not returned promptly and applied within their territory.

- **Non-local partners in participatory action research need to have something to offer.** To be useful and justify their presence, the non-local partners and facilitators in an action research process need to master their technical background as well as research and communication skills. Unskilled facilitators are useless or even detrimental and expose everyone to frustrating experiences. The best way to learn how to facilitate action research exercises is by doing it with an experienced colleague.

- **Local culture deserves respect.** An action research process which is conducted and managed according to local customs is much more likely to be successful in the eyes of all participants. Information should be handled carefully. Whenever requested, anonymity and discretion in sharing information with others should be assured. Communities appreciate respect for local traditions, e.g., following local protocols for introductions. At the same time, partners and facilitators should be aware that cultures and communities are dynamic...
entities: they change, and often rapidly. Attempts to restore customs and practices which the community has already dismissed are unlikely to succeed and may cause resentment. People do not like to be told what to maintain and what to change in their culture.

- **Communication is a major concern.** Conducting action research exercises in the local language (i.e., the variant of the national language spoken in the area or the local ethnic vernacular language) ensures full participation by the local community, regardless of education. Consecutive translation is tedious, boring to participants and not appropriate. If the PAR partners are not comfortable with the local language, bilingual facilitators can be recruited and trained.

As already pointed out, simple written materials (such as flipcharts) are often very useful, yet their value is limited in situations where literacy is low. Visual aids, such as drawings, maps, photographs, slides and videos, are always recommended, and they are essential when the majority of participants are non-literate. It is, however, a good strategy to test the cultural acceptability of these tools beforehand. At times, specific colors or images may be culturally sensitive or linked inappropriately with local political, religious or ethnic divisiveness.

As crucial as it is to recognize the central role of the local actors through these behavioral rules, participants and facilitators will need to avoid an oversimplified conclusion that local perceptions, knowledge and experience are the final or only truth. Just like academic institutions and development agencies, local communities are influenced by many forces that can bias their capacity to analyze their situation and make effective decisions for improving it. Prejudices, conflicts, corruption, privileges, resistance to change, indifference and discrimination are widespread among all types of societies, agencies, institutions and communities. Therefore, a good action research process engenders an open and possibly critical attitude towards both indigenous and external points of view.

In practice, this means that an action research process entails an exchange and possibly a mediation between what local people think and wish to do and what is suggested by other sources of knowledge, including development professionals and various kinds of research. Where population dynamics and natural resource management are concerned,
...PAR results may be considered valid and reliable when their application is environmentally beneficial and/or brings about an actual improvement of the living conditions of the people...

the findings of biological, ecological, medical, demographic, economic, social and cultural studies carried out by outsiders have an important complementary role together with local knowledge of the environment and society. Participatory action research methods can also be used in facilitating the presentation of technical findings to non-specialized audiences.

Validity and reliability of participatory action research results

In conventional research, validity is taken to mean how close the findings are to reality; and reliability is equated with constancy of findings. When it comes to participatory action research, the concepts are interpreted somewhat differently. In striving for sustainable development, PAR results may be considered valid and reliable when their application is environmentally beneficial and/or brings about an actual improvement of the living conditions of the people, which can be sustained over time with minimal cost to the environment. In other words, 'valid' and 'reliable' are understood from the perspective of local people. The results of the research have to be first of all meaningful and positive for them.

By starting from local knowledge and wishing above all to empower people to define what constitutes problems, opportunities and solutions for them, participatory approaches challenge the conventional tendencies to rely on 'scientific' knowledge and external authorities. Yet, validating findings is an important concern which, in PAR, is dealt with by a method known as triangulation. In a strict sense, to triangulate means to utilize at least three different points of view to analyze a given event or situation. More generally, triangulation is based on the idea that using multiple sources and methods is the best assurance of the validity, reliability and completeness of the collected information. Two basic modes of triangulation are used in action research: external and internal triangulation.

'External triangulation' involves a comparison between the information generated by participatory action research and data from external sources, such as censuses, official statistics, aerial photographs, or local independent research and technical studies. External triangulation is often based on a review of secondary data, i.e., information already existing and available from national and local agencies and academic...
institutions or published in papers and books. Less frequently, additional studies, such as quantitative surveys, are used to validate qualitative action research findings.

‘Internal triangulation’ refers to a set of techniques for strengthening validity within the action research exercise itself. These techniques include:

- **Comparison of different perspectives.** Different interest groups may have views and perceptions of ‘reality’ that are different from each other. One way to understand these co-existing views is for different interest groups to go through the same exercises, e.g., to compile their own separate lists of concerns and then – possibly – compare and discuss them (see Chapter 5).

- **Use of different methods and techniques for exploring the same topic.** For instance, a description of the way in which the community uses its territory may be developed through a combination of observational walks, interviews with groups and a participatory mapping exercise with community members.

- **Involvement of non-local professionals with different disciplinary backgrounds.** Different disciplines will raise different questions about the same issues, thereby stimulating deeper analysis by the participants. For instance, family planning needs among the women of a community might be assessed through a combination of open-ended interviews by an anthropologist, reproductive life histories collected by a nurse and a group discussion with the local women’s association, where the first two types of information can be presented, reviewed and additional ideas elicited.

This discussion of external and internal triangulation helps to show that participatory action research describes and analyses problems or situations through an overlapping variety of techniques, perspectives and social interests. Therefore, multidisciplinary teamwork, capability to combine local understanding with scientific explanation, and readiness to shift from theoretical reasoning to concrete decision-making are key elements for the successful application of participatory action research in real-life settings.
Even when all these conditions are present, however, PAR practitioners will continually be challenged by difficult questions, such as:

- Is the local classification of soils, as explained by one well-experienced village elder, compatible with the optimal use of this resource?
- Can we assume that the traditional means of contraception in the region are safe and effective?
- To what extent do existing local institutions provide a structure for equitable and effective decision-making concerning the local environment and population dynamics?
- How genuine is the consensus achieved at the last participatory planning or evaluation meeting?

It may be helpful to remember that the answers to such questions need to make sense for both the PAR facilitators and the local people, and that both questions and answers may be reframed and evolve with time.
4. PAR on population dynamics and the local environment: information gathering and appraisal
Any participatory action research on population dynamics and the environment begins by appraising the current situation. In this chapter the design of a comprehensive appraisal is outlined. Practical suggestions are provided for environment and development professionals to:

- become familiar with the local setting and make preliminary contacts with the concerned community;
- identify suitable interest groups to be involved in the action research process and help them to identify PAR topics;
- collect and review relevant information from secondary sources (existing documents);
- assist local people to gather new information through various appraisal exercises.

In a number of the example boxes, a fictitious village named 'Amada' is used for illustrative purposes. The names and data are a composite based on experiences in different countries. Additional information on specific field methods can be found in Annex B.

4.1 Preparing for participatory appraisal

Building a support team for participatory action research
Making contact with influential community persons
Preliminary participant observation sessions and interviewing
Review of secondary information
Focusing the participatory appraisal

4.2 Carrying out participatory appraisal

Participatory environmental appraisal (environment profile)
Participatory censuses (population profile)
Participatory health appraisal (health profile)
Gender analysis focusing on reproductive issues
format, with the external consultant acting more as a supporter than a director of activities. In this learning process, special attention can be given to the attitudes of the members of the support team, which should be conducive to a genuine participatory approach.

**Making contact with influential community persons**

Once the team is set and oriented to the purposes and methods of action research, exploratory field visits can be carried out in the concerned communities. An important task in these visits is establishing contact with the local leaders, authorities and other influential persons. These initial contacts can be done in a relaxed and relatively informal way by small sub-groups of 2–3 team members. The scheduling of such meetings is best arranged at the convenience of the local people – which, in most rural communities, is usually late afternoon.

Meetings with local authorities and leaders will be an occasion to present the reason for the team’s presence in the community. Permission may need to be requested for team members to contact local people and observe the community setting. The essential message could be:

*We are here to learn about your community together with you. We are especially interested in understanding what you perceive as problems, resources and strategies for living in this area. We hope to learn about your strengths, and we will look at factors or situations that limit your capacity to improve your own quality of life. We are especially interested in hearing from you what would be important to know, and what specific questions you yourselves would like to be able to answer. And, if you have some unanswered questions or problems that need resolving, we would be glad to support you in addressing them through research, planning and action.*

There is a risk of raising unrealistic expectations or creating distrustful feelings during this first encounter and in subsequent interactions with community members. It is important to be clear up front about the ability of the support team to commit to long-term follow through, or to bring funds into the community. Also, a good understanding of local etiquette will be extremely useful to the successful introduction of the PAR initiative. The team will also need to remain sensitive to excluded or minority groups who may not be represented among or even mentioned by the community leaders.
4.1 Preparing for participatory appraisal

A participatory action research process begins with some steps that help communication flow between the relevant community and the non-local professionals and focus the exercise on topics of common interest. This includes building a support team for PAR, making contacts with influential community persons, carrying out preliminary participant observation sessions and interviews, reviewing secondary (i.e., existing, already compiled) information, and drafting the participatory appraisal design.

Building a support team for participatory action research
The best support for participatory action research is a professional team that is sensitive (i.e., capable of working with local people in a consistent, friendly and relaxed way) and technically skilled (i.e., capable of facilitating and applying relevant methods and tools and providing technical information and support, as needed).

An ideal support team for a participatory appraisal exercise is comprised of a balanced mix of people with theoretical and practical expertise. The most appropriate members will be persons who are knowledgeable about the local setting, language and culture and have a record of good relationships with the local communities. As gender issues are critically important in such a process, it will help to include both men and women as active members of the team.

The team will be strongest if a variety of expertise is represented. Depending on the scale of the project, the professionals for a participatory action research team focused on environment and population might include persons with training in environmental sciences, public health and social sciences. The size of the team should be proportional to the size and accessibility of the territory and the community population to be involved in the activities: 5–10 full-time persons may be sufficient to manage a PAR initiative at district level within a reasonable number of months. Smaller teams are more appropriate if the territory is limited to a selection of ‘pilot’ villages or settlements.

If none of the selected team members has solid experience in PAR methods, it is recommended that a resource person (consultant) be recruited for a start-up and training period. Terms of reference for the consultancy could stress the need for transferring sufficient skills and knowledge to the team to enable them to facilitate a comprehensive PAR activity. Training will be most effective when provided in a ‘learning by doing’
Conducting regular evening debriefing sessions among team members will help to monitor the state of the relationship between the team and the community.

**Preliminary participant observation sessions and interviewing**

Once introductions are made and, if necessary, formal permission is obtained, team members may spend some days in the community observing what is going on and finding ways to talk with people. Opportunities to meet natural groups (see Chapter 2) for an informal conversation occur in many everyday activities, such as: queuing for the bus, drinking tea at a public stall, taking a walk though the fields, sitting in the village square and, in some cultures, visiting private homes. Natural groups might include women waiting for their turn at a water source or washing clothes, men engaged in community work or sitting together socializing, youngsters playing football, etc.

In these preliminary observations and informal interviews the team can identify existing **interest groups in the community** (see Box 4.1). Such groups are more or less organized clusters of persons who share a
Table 4.1
Example of a completed matrix for identifying interest groups (‘Amada’, 1997)

<table>
<thead>
<tr>
<th>Group and members</th>
<th>Meeting place</th>
<th>Key interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers of a family: Martha, Paula, Suwa, Ipiak, Dora, Kapuchka</td>
<td>Primary school</td>
<td>Health and nutrition of their children</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Avoiding further pregnancies</td>
</tr>
<tr>
<td>Farmers, owners of field on the river banks: Armando, Taish, Kuunt, François, Tsanim, Kukush, Pablo, Eben</td>
<td>Their plots</td>
<td>Protecting the fields from winter river flooding</td>
</tr>
<tr>
<td>Farmers, owners of fields on the hills: Antun, Felipe, Armando, Wananch, Pakunt, Kunchim</td>
<td>Their homes</td>
<td>Controlling erosion and loss of soil fertility in high slope fields</td>
</tr>
<tr>
<td>Landless young men: Juancho, Luis, Milton, Marcos, Pancho, David, Charles, Acab, Jean-Paul</td>
<td>Football ground</td>
<td>Income-generating activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jobs</td>
</tr>
<tr>
<td>Young, unmarried girls: Nena, Rosa, Tsaa, Nunkui, Maria, Giselle</td>
<td>Washing place on the river bank</td>
<td>Working opportunities in the village for their boyfriends who migrated to town, and training opportunities for themselves</td>
</tr>
</tbody>
</table>

common interest, e.g., bicycle taxi drivers, woodcutters, women market vendors, traditional birth attendants, farmer clubs, etc. As interest groups are usually the main actors in the action research process, this task is of great importance. Readiness and capability of local leaders, school teachers, community workers and aged influential persons to collaborate as key-informants can also be explored during these visits.

Various kinds of information can be gathered informally in these initial contracts, including main livelihood activities, common age- and gender-related roles and behaviors, and typical daily or seasonal activities in the village.

Discreet note-taking after observation sessions will help to gradually build a database, which the team can review during debriefing sessions. Grids (tables or matrices) can be created to help identify and summarize the clusters of persons likely to form an interest group and the interest
which is keeping them together (see Table 4.1). If needed or applicable, a comparison between different sites (villages or settlements) may help to identify patterns of interest groups in the region to be covered by the action research initiative.

**Review of secondary information**

The preliminary interaction with the community can be complemented by a review of existing compiled information (secondary information). Types of data and documents likely to be available and useful include:

- local population figures from the last national census;
- local/regional statistics from education, agriculture and health sectors;
- geography and resource maps;
- documents on local economy, ecology and culture (e.g., ethnographies, church records, records of market fees);
- project documents, annual reports, reviews, etc., from local organizations, institutions and agencies involved with population or environment issues.

Reviewing this information will help in compiling a baseline profile of the community that includes demographic, environmental, economic and socio-cultural aspects. It is worth remembering, however, that finding a figure in printed form does not necessarily mean that that figure is accurate. Among the potential difficulties likely to be encountered are contradictory statements in different sources, and information which is outdated or no longer relevant for various reasons.

The secondary information can be compared (triangulated) against the ‘primary’ information collected during the initial observations and interviews. Similarly, interviews with knowledgeable persons can be used to check for the current validity of printed data. Calculation of quantitative indicators (see Annex A) may help to summarize some scattered information.

**Focusing the participatory appraisal**

A possible next step is to generate a list of specific action research questions concerning environment and population dynamics in the
Box 4.2

Example of a set of PAR questions on population dynamics and the local environment ('Amada', 1997)

1. Are the seasonal flooding of the river banks and the decreasing productivity on the hillside plots related to the way we manage our resources? Are they related to changes in the population of our village (e.g., migration of young people, growth of number of households)?
2. What can we do to reduce these problems?
3. Which natural resources (e.g., forestry products) can be exploited in a sustainable way for income generation? How can access to these resources be granted to unemployed, land-less youngsters?
4. Is there any chance to create job opportunities in the village and thus reduce the work-related emigration of young men (and women)?
5. What training opportunities exist for young women? Can these be improved? Can these be linked to existing environment and population issues?
6. Are the figures for population growth reported by the census valid for this village and the other villages of the project area? Are reports of high levels of male emigration by villagers and by government agencies accurate?
7. Is the health and nutritional status of children in this village as worrying as some mothers say and several observations suggest?
8. Why, despite the complaints about the number of pregnancies, do women and men in this village not utilize the family planning services available at the district health center?

relevant communities. These have to be the community’s own questions, although some of the members of the support team are likely to be professionally interested in the matter (e.g., because they are employed locally in environment or development initiatives). Such team members may contribute to phrasing the questions, making them more specific or proposing to add some dimension of concern (e.g., sustainability, equity). The questions can be elicited through individual interviews, group discussions or even in an open community meeting. Once various questions have been listed (see Box 4.2), they can be clustered by main topic by the community and the support team.

Next is linking the topics to be investigated with the community persons having the strongest concerns about each topic, i.e., their ‘interest groups’. A matrix can be generated by overlapping the research questions list with the interest groups list (see Table 4.2). Based on this matrix and on the direct knowledge of persons and place gained by interaction with the community, the support team can invite some members of relevant interest groups to participate in the action research process. As a first step, it will be important to discuss issues affecting their capacity to participate, e.g., available time, willingness, literacy and any special skills. Literacy can be helpful, e.g., for taking notes, but should
Table 4.2
Example of a completed 'what' and 'by whom' action research matrix ('Amada', 1997)

<table>
<thead>
<tr>
<th>What is to be investigated?</th>
<th>Who could participate in studying (who has a particular interest)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causes of and remedial action for seasonal flooding at the village level</td>
<td>Owners of river bank plots</td>
</tr>
<tr>
<td>Causes of and remedial action for erosion on the hills</td>
<td>Owners of hill plots</td>
</tr>
<tr>
<td>Potential and constraints for sustainable agro-forest activities</td>
<td>Landless residents</td>
</tr>
<tr>
<td>Population dynamics in the village, with a special emphasis on migration trends and their causes</td>
<td>Young women and men</td>
</tr>
<tr>
<td>Training and job opportunities in environment and population</td>
<td>Young women and men</td>
</tr>
<tr>
<td>Health and nutrition of children</td>
<td>Mothers</td>
</tr>
<tr>
<td>Use, acceptability and accessibility of family planning services</td>
<td>Married women and men</td>
</tr>
</tbody>
</table>

never be an essential requirement for participation. Also, interest groups can be involved in a prominent way to explore questions of importance to them, but should not be the only people involved in exploring such questions. Ideally, a few members of each interest group will agree to participate in all PAR exercises in an active way.
4.2 Carrying out participatory appraisal

Four clusters of action research techniques are especially relevant for dealing with population dynamics and the local environment in an integrated way:

- participatory environmental appraisal (environment profile);
- participatory censuses (population profile);
- participatory health appraisal (health profile);
- gender analysis focusing on reproductive issues.

The clusters above can be adapted, focused and combined according to the identified set of research questions, the needs of the community, and the relevant environment and development initiatives that may exist or are being set up in the area. While the descriptions included here assume that the participatory action research is done prior to starting any new initiative, the same techniques could also be used for assessing (and possibly re-focusing) an existing project. Repeated collection of the same data over time will allow comparisons of the situation before and after the project intervention, which is helpful for evaluation. In the following we will describe generic approaches, but those will obviously need to be bent around the specific questions to be answered and information already available.

**Participatory environmental appraisal (environment profile)**

The purpose of a ‘participatory environmental appraisal’ is to assess the situation of natural resources in the community’s territory. A well-run appraisal can help to enhance or focus the awareness and concern of interest groups and the community at large on natural resource management. Interest groups and the community may find out together what is locally achievable to prevent or reduce environmental degradation. The participatory environmental appraisal can also provide data to improve district-level planning for natural resource management.

A typical participatory environmental appraisal will use a combination of two or more of the following methods of data collection:

- observational walks and transects;
- participatory mapping;
- ranking exercises;
- slide-language.
**Box 4.3**

**Potential questions for dialogue during an exploratory walk**

- What natural resources (e.g., forest products) are being used?
- Who uses them specifically?
- Who collects them?
- Who buys them?
- How dependent are the local persons on the use of such products?
- What is the relative value of these resources for the local communities, compared to other sources of income?
- What influence do wealth and other household characteristics have on resource use?
- What uses are the most important?
- Where are the resources used/gathered from?
- How much of each resource is being used?
- What estimate can be made of the potential impacts of present rates of use on the future quality or quantity of the resource?

*From: Scott, 1996*

Literacy is not necessary for participation in any of these exercises, which can be carried out with elders, women, men, youngsters and even children. For an environmental appraisal, the most desirable or appropriate participants will be community members directly engaged in exploiting (using) and/or managing (regulating the use of) key natural resources (such as soil, fuel wood, timber, forestry products, fish, game, irrigation water, etc.). Due to the typical patterns of labor division by gender in most rural economies, participation of both men and women representatives from the same households, in joint or separate settings, is strongly recommended.

An **observational walk** across the territory with interest group members is often a good starting point. As much as possible, it is desirable that the walk follows a meaningful route, such as a straight line across a slope valley or going downstream-upstream. Things to watch for include changes in the landscape (e.g., forests, pasture, barren land, cultivated plots, beaches, etc.), relevant environmental features (e.g., vegetation coverage, types of crops, native plants and animals, water sources, types of soil, erosion phenomena, etc.) and interaction of people and resources (e.g., people collecting products, people using some areas for specific purposes, settlements, field enclosures, etc.). These observations can be discussed with participants and persons met on the way, and then jotted down in a logbook. Ideally, the jotting will be a combination of sketches and words and will be jointly prepared by the support team and local PAR participants.
Figure 4.1

Example of a slope-valley transect

<table>
<thead>
<tr>
<th>Soil</th>
<th>rocky</th>
<th>gravel</th>
<th>gravel</th>
<th>sand</th>
<th>clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landuse</td>
<td>forest</td>
<td>farmland</td>
<td>village</td>
<td>farmland</td>
<td>farmland</td>
</tr>
<tr>
<td>Crops &amp; Vegetation</td>
<td>trees, bamboo</td>
<td>grass, shrubs, millet, sesame</td>
<td>sesame, beans, hibiscus</td>
<td>sorghum, groundnuts</td>
<td></td>
</tr>
<tr>
<td>Problems</td>
<td>erosion</td>
<td>drought, pests</td>
<td>drought, pests, low soil fertility</td>
<td>drought</td>
<td></td>
</tr>
<tr>
<td>Opportunities</td>
<td>fuelwood, timber, bamboo</td>
<td>pasture, rainfed farming</td>
<td>market, transport, water, credit, health-care, school</td>
<td>pasture, rainfed farming</td>
<td>flood, recession farming</td>
</tr>
</tbody>
</table>

Source: Theis and Grady, 1991

Because of the objectivity and detail in pictures, photography can also be used. Yet, the method has some drawbacks, including cost, delays between taking the pictures and being able to show the results to the community and difficulties showing slides in remote areas that lack electricity. In addition, the method can shift ownership of the process away from the community because the technology may not be locally available or locally controlled.

The analysis of the data will be more meaningful when done with the active participation of concerned interest group members. An important step in this analysis is the creation of a transect representation of the territory, similar to the one presented in Figure 4.1 (see also Annex B, section B.1), which shows information related to the physical and human geography, and provides brief descriptions of problems and opportunities.
Participatory mapping (see Figure 4.3a and Annex B, section B.2) is also a useful and exciting tool for environmental appraisal. In participatory mapping, community members are asked to locate relevant environmental features and resources on a self-created map of their territory. Such maps can be drawn on the ground or a floor, a chalkboard in a school or a sheet from a flipchart. They can be either entirely constructed by local people or facilitated by the support team, who can provide a base map of basic features obtained from aerial photographs (e.g., forest borders, roads, and crop land) and then invite the participants to complete the picture. The map may represent purely physical features, such as roads, houses, soil types and vegetation, but it can also include social phenomena, e.g., access to resources by specific groups or household wealth. Usually, building up the map provides an occasion to discuss several phenomena and resource management issues. Once completed
importantly, the historical perspective will help in assessing how the local environment has been influenced by the community's economic or cultural needs, by population dynamics and by external phenomena.

by the group, the map can be copied onto a flipchart, possibly by a local artist.

Information on the current environmental situation provided by the transect walks or mapping become most enlightening and effective when reviewed from a historical perspective. This can be done by discussing the findings with some local elders who can recall details about the environmental situation and local interactions with the environment more than one generation ago (at least 20–30 years previously). The historical data produced in this way (see Figure 4.2, Figure 4.3b and Annex B, section B.3) will permit focusing on environmental changes that have occurred during the last generation.

Importantly, the historical perspective will help in assessing how the local environment has been influenced by the community’s economic or cultural needs, by population dynamics and by external phenomena (e.g., expanding or shrinking prices for certain crops or natural
resources, wars and civil disruption, etc.). The development and analysis of a historical transect and/or map can in fact become the central and most useful moment in the participatory appraisal of population dynamics and the local environment, stimulating lively debate and discussion.

A comparison at different points in time can also be projected into the future – e.g., participants can be asked what they expect the situation to be like in 30 years if the present trends continue. This question is best coupled with a historical mapping exercise that compares the present and past situations. Discussions about alternative courses of action arise easily after this type of analysis. Key questions to ask the participants include:

- Is this the future (or trend) the community wants?
- What could be a different future?
- What needs to happen for a different future to come about?
Alternative visions of the future will likely involve discussions surrounding the use of land and other natural resources in the next 20–30 years. Community members may wish to produce a third map, depicting the ideal future, in which, for instance, common lands and resources are well managed; water supply and sanitation are greatly improved; and soil conservation practices, agro-forestry and other efforts are in place to rehabilitate croplands and pasture.

When a mapping exercise is completed, the PAR support team and community participants may wish to transfer the map of current environmental and social features to a computer mapping software such as Map Maker (see Annex C, section C.2). This easy-to-use ‘shareware’ package allows one to create a basic geographic information system, in which layers of information can be added together to create maps of varying complexity, and specific variables (such as the size of land holdings) can be stored in a simple data base. These locally created maps can also be compared with professional maps to locate specific details.

Whether the map is transferred to a computer and printed out, or copied on to a flipchart, it is important to remember that the map belongs to the community. In other words, the support team may want to make a copy for their own use, but the original copy should stay in the community.

Another way to build on the information generated by the environmental appraisal is to use ranking exercises (see Annex B, section B.8). Ranking exercises are a way for community interest groups to prioritize their concerns or preferences about the situation of different natural resources (see Table 4.3).

Ranking exercises carried out by gender-based groups (possibly also sub-divided by age) (see Table 4.4) are a useful way to initiate a gender analysis of the collected information (see Annex B, section B.13). When combined with data on gender-related rights and responsibilities in resource management, the gathered information offers a fairly complete picture of gender-based interests and roles (actual and potential) in the community.

The final method we will mention here is slide language, which is a way of using photographed images (pictures or slides) to promote reflection.
Table 4.4
Example of a gender-based matrix of environmental concerns

<table>
<thead>
<tr>
<th>Rank</th>
<th>Married men</th>
<th>Young men</th>
<th>Elderly men</th>
<th>Married women</th>
<th>Young women</th>
<th>Elderly women</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Erosion</td>
<td>Timber</td>
<td>Game</td>
<td>Fuel wood</td>
<td>Fuel wood</td>
<td>Wild fruits</td>
</tr>
<tr>
<td>2</td>
<td>Flooding</td>
<td>Erosion</td>
<td>Erosion</td>
<td>Erosion</td>
<td>Drinking water</td>
<td>Erosion</td>
</tr>
<tr>
<td>3</td>
<td>Game</td>
<td>Game</td>
<td>Fish</td>
<td>Fish</td>
<td>Fish</td>
<td>Fish</td>
</tr>
</tbody>
</table>

A local participatory census can arouse local concern with respect to existing patterns in population dynamics

in all contexts. Where slide projectors are not available, or there is no electricity, photo montages may be a suitable alternative.

Whatever the tool (or combination of tools) used for data collection and analysis, a major aim of a participatory environmental assessment is the creation and discussion of a detailed list of environmental concerns (issues, problems) and key resources as perceived by the community. These may be related solely to the research questions identified at the beginning of the PAR, or expanded on these. This list and the findings which support it can be communicated back to a broader community audience and re-discussed for validation and further ideas. Brainstorming and group discussion can facilitate making amendments and additions, so that a group consensus on the list can be reached.

Participatory censuses (population profile)
In many countries, fairly good data about the size and dynamic trends of populations are available from national censuses and civil registers. These data include measures of mortality, natality, fertility, natural growth and migration (see Annex A for definitions and formulas). Valuable as this information is, it normally has limitations. The census data are generally analyzed at the national, provincial and district levels; and a breakdown of census information for small municipalities or rural villages is seldom available. Census data are usually collected only at quite long intervals, e.g., once per decade, and thus may be out of date for specific local needs. Moreover, civil registers in rural areas are generally not reliable: births may be registered with a delay of several months, infant deaths may not be recorded at all, and temporary and seasonal migration may not be considered.
Table 4.3
Example of a completed matrix ranking households’ concerns for different natural resources (‘Amada’, 1997)

<table>
<thead>
<tr>
<th>Household</th>
<th>Rank</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taish/Dora</td>
<td></td>
<td>Fields on river banks (flooding)</td>
<td>Fuel wood</td>
<td>Fish</td>
<td>Game</td>
<td>Wild fruits</td>
</tr>
<tr>
<td>Armando/ Nunkui</td>
<td></td>
<td>Fuel wood</td>
<td>Fish</td>
<td>Timber for trade</td>
<td>Game</td>
<td>Hill-fields (erosion)</td>
</tr>
<tr>
<td>Kuunt/ Kapuchka</td>
<td></td>
<td>Fields on river banks (erosion)</td>
<td>Hill-fields for trade</td>
<td>Game</td>
<td>Fish</td>
<td>Building materials</td>
</tr>
<tr>
<td>Pakunt/Suwa</td>
<td></td>
<td>Hill-fields (erosion)</td>
<td>Timber for trade</td>
<td>Game</td>
<td>Fish</td>
<td>Fuel wood</td>
</tr>
<tr>
<td>Kukush/Ipiak</td>
<td></td>
<td>Fields on river banks (flooding)</td>
<td>Fish</td>
<td>Fuel wood</td>
<td>Timber for trade</td>
<td>Building materials</td>
</tr>
<tr>
<td>Milton/Paula</td>
<td></td>
<td>Timber for trade</td>
<td>Hill-fields (erosion)</td>
<td>Fish</td>
<td>Building materials</td>
<td>Fields on river banks (flooding)</td>
</tr>
</tbody>
</table>

and awareness and/or collect specific information. Local people are trained to use a simple (or disposable) camera to take pictures of significant aspects and good and bad features of their lives and their environment. It is important to recruit a variety of photographers (e.g., men and women, farmers and traders, the wealthy and the poor) as each will have a different perspective of what is relevant, and this can reveal important differences in environmental perceptions. The pictures or slides are exhibited and discussed in a group or community meeting. The basic steps for using slide language are described in Annex B, section B.12.

Slide language is an attractive and fun way of identifying environmental issues and the various perspectives on these in the community concerned. Letting the community members identify the messages and the scenes to be used encourages them to study and analyze their environment, and it is an effective way of giving a voice to disadvantaged groups. However, slides are a relatively expensive tool, they take time to develop (especially if the film must be sent away) and slide projectors may not be available.
Social mapping for participatory village censuses

In participatory social mapping, villagers show the location of households. This has been extended in India by Sheelu Francis and others into participatory censuses (household inhabitants are estimated and indicated on the map). Another variant is health mapping, in which symbols are used to indicate where people of different types and with different conditions (e.g., disabilities, recent deaths, etc.) reside in a village. In a census, one common practice is for villagers to use seeds of different sorts to represent people. Another, invented by Anusuda and Perumal Naicher of Kethanayakanpatty village in Tamil Nadu, is to have a card for each household and mark details with symbols on the card.

Triangulation of censuses took place in Ramasampatti village, near Tiruchuli, in Tamil Nadu, in May 1991. In a participatory rural appraisal training organized by SPEECH, a local NGO, four groups of between 5 and 15 villagers used different methods of analysis and presentation: two did social mapping directly on paper; one made a ground model of the village with a card for each household; and one did a seed census on to a map drawn on a floor. All four independently generated a population figure of 355 for the same village.

Adapted from: Chambers, 1992

To get an accurate and current profile of the population situation and trends at the community or village level, a local participatory census may be appropriate. This exercise has a two-fold purpose: to provide valid, reliable and up-to-date demographic information based on the local people’s knowledge of local vital events (i.e., births, deaths and migrations); and to arouse local concern – if appropriate – with respect to existing patterns in population dynamics.

Two main data collection methods can be used to conduct a participatory census:

- social mapping;
- semi-structured household interviewing.

Social mapping is an exciting and popular exercise in most communities. It is carried out in a participatory fashion, similar to the natural resource map discussed in the previous section of this chapter. Community people collaborate in drawing a map of the territory and locating households and compounds. The community members involved in the exercise are then asked to recall the number of people living in each household/compound, including all members by age and gender. This participatory technique is extremely effective for performing a rapid, low-cost census in small communities, even where literacy rates are very low. The validity of participatory census figures generated by the local people is usually quite high (see Box 4.4). Nevertheless, impor-
Example of participatory census interview guide

1. Household members:
   - How many persons live in this household?
   - How many babies (under one year of age)?
   - How many small children (1–4 years old)?
   - How many older children (5–14 years old)?
   - How many young and adult men (15–59)?
   - How many young and adult women (15–59)?
   - How many elderly men (over 60)?
   - How many elderly women (over 60)?

2. Are there any women currently expecting a baby?

3. Did you mourn the death of a member of the household in the last year? If yes, how old was he/she?

4. When did your family settle in this place?

5. Did any member of this household leave the area for work this year?
   - If yes, when did he/she leave? *
   - When is he/she supposed to come back? *

* Time of occurrence is often best recalled if a reference to some important event in community life is made (such as harvest time, rainy season, etc.).

Consider any local cultural sensitivity about openly discussing pregnancies, births and deaths.
### Example of participatory census interview summary form

<table>
<thead>
<tr>
<th>Household number:</th>
<th>Location:</th>
<th>Amada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of interview:</td>
<td>Interviewer:</td>
<td>Christine</td>
</tr>
</tbody>
</table>

**Number of persons living in household (reference to Question 1)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number</td>
<td>7</td>
</tr>
<tr>
<td>Babies (under one)</td>
<td>1</td>
</tr>
<tr>
<td>Small children (1–4)</td>
<td>2</td>
</tr>
<tr>
<td>Older children (5–14)</td>
<td>1</td>
</tr>
<tr>
<td>Adult men (15–59)</td>
<td>1</td>
</tr>
<tr>
<td>Adult women (15–59)</td>
<td>1</td>
</tr>
<tr>
<td>Elderly men (over 60)</td>
<td>none</td>
</tr>
<tr>
<td>Elderly women (over 60)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Natality, fertility and mortality (reference to Questions 2 and 3)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women</td>
<td>1</td>
</tr>
<tr>
<td>Children born in the last year</td>
<td>1</td>
</tr>
<tr>
<td>Deaths occurring in the last year</td>
<td>2 (1 small child, 1 elderly man)</td>
</tr>
</tbody>
</table>

**Settlement and migration (reference to Questions 4 and 5)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years living in the current location</td>
<td>2</td>
</tr>
<tr>
<td>Household members emigrated in the last year</td>
<td>1 (younger brother of the husband)</td>
</tr>
</tbody>
</table>

- Departure: December 1996
- Return: March 1997

---

especially low, but gender rules and interaction within the community need to be carefully considered before making such a decision. Questionnaire design and interviewer training will also need to consider any local cultural sensitivity about openly discussing pregnancies, births and deaths (for instance, if the death of a child is considered for any reason a stigma to the family, the local child mortality may end up being underestimated).

Key elements to the success of the exercise include a relaxed but attentive attitude during the interview, good note-taking, and the quality and promptness of systematically organizing the raw data collected. Role-playing among members of the participatory census team may help them to acquire and develop these skills in a practical and active manner.

Analysis of the data from a census can be aimed at developing local demographic indicators. Simplification of calculations and use of local concepts and terms may render this component of the exercise more relevant and accessible for the participation of community members. Box
### Example of completed participatory census ‘Consolidated Information Form’

**Box 4.7**

<table>
<thead>
<tr>
<th>Population Characteristics</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inhabitants</td>
<td>782</td>
</tr>
<tr>
<td>Number of infants (&lt;1 year old)</td>
<td>36</td>
</tr>
<tr>
<td>Number of small children (1–4 yrs old)</td>
<td>105</td>
</tr>
<tr>
<td>Number of older children (5–14 yrs old)</td>
<td>211</td>
</tr>
<tr>
<td>Adult men (15–59 yrs old)</td>
<td>179</td>
</tr>
<tr>
<td>Adult women (15–59 yrs old)</td>
<td>212</td>
</tr>
<tr>
<td>Elderly men (&gt;60 yrs old)</td>
<td>15</td>
</tr>
<tr>
<td>Elderly women (&gt;60 yrs old)</td>
<td>24</td>
</tr>
<tr>
<td>Babies born in the last year</td>
<td>39</td>
</tr>
<tr>
<td>Deaths mourned in the last year</td>
<td>15</td>
</tr>
<tr>
<td>Babies who did not survive their 1st year</td>
<td>4 (1 baby for every 10 babies born in that yr)</td>
</tr>
<tr>
<td>Small children who died before age 5</td>
<td>6 (1 for every 23 children under age 5)</td>
</tr>
<tr>
<td>Number of women expected to deliver before the end of the year</td>
<td>41</td>
</tr>
<tr>
<td>‘Normal’ household size</td>
<td>9</td>
</tr>
<tr>
<td>Number of households settled in the village for at least 10 years</td>
<td>78</td>
</tr>
<tr>
<td>Number of adult men emigrated in the last year</td>
<td>26 (1 for every 7 resident adults)</td>
</tr>
<tr>
<td>Number of adult men who did not return during the last year</td>
<td>5 (1 for every 5 resident adults who left the village)</td>
</tr>
</tbody>
</table>

Based on data presented in this box, Amada’s population in 1997 had a crude birth rate of 50 per 1,000 (39 births/782 inhabitants x 1,000); a crude death rate of 19 per 1,000 (15 deaths/782 inhabitants x 1,000); and a natural growth of 3.1% (50 – 19 = 31 per 1,000, or 3.1 per 100).

4.7 presents a hypothetical example of information tallied in a participatory analysis of census interview results.

The census exercise provides good occasions to discuss the local population situation and dynamics with various interest groups and the community at large. Meetings can be arranged for this purpose with different community audiences. Pie charts, bar charts and pictograms can be useful to illustrate the results of the census. Ideally, the community would have gone through a historical mapping exercise and the maps...
could be discussed again in the light of the data collected on population dynamics. The PAR support team may also bring in the identified research topics by asking questions such as:

- Why have so many infants and children died in the village?
- Why do most families have five or more children?
- Currently, is the village population increasing or decreasing?
- Within how many years will the village population reach (say) 1,000, 1,500 or 2,000 inhabitants?
- Do we have enough land and water to fulfill the needs of such a population?
- Why are so many adult men looking for jobs outside the village?
- Why do some of them not return?
- Is there anything we can do to respond to the problems we have discussed?

By answering these questions, the community and the support team members will clarify issues, perceptions and priorities. The answers, and associated discussions, should be recorded for future reference.

The measures of population size and dynamics obtained in the local census can also be used to calculate the more sophisticated demographic indicators, such as life expectancy, presented elsewhere in this manual (see Annex A). In this way, the participatory census can provide accurate local data for a district or municipal demographic database and be used for local demographic projections (see Annex C).

**Participatory health appraisal (health profile)**

The health status in a given locality affects and is affected by the community’s population profile and its patterns of using natural resources. A comprehensive local environment and population appraisal will thus elicit information also on the local health situation. In particular, the nutritional status, the most common health problems and health risks present in the community, and the available medical and public health services will need to be investigated.

In the last 15 years, rapid, qualitative and participatory methods have been tested and accepted in many countries as an important aid for
health services decision-making. Labeled ‘rapid epidemiological appraisal’ or ‘qualitative health services research’, these methods can be useful for dealing with the health-related aspects of participatory action research. The following, in particular, are good as entry points for interest groups assessing their health needs and linking those to environmental and population variables:

- health-risk mapping;
- child nutrition assessment;
- strengths, weaknesses, opportunities and limitations (SWOL) analysis of available health services.

**Health-risk mapping** is a variant of participatory mapping in which community members:

- start with a brainstorming on the most common health problems felt in the community in the last six months or a year, and draw up a list of those problems;
- draw a map of the area or settlement, plot the distribution by household of the identified health problems (e.g., malaria, tuberculosis, child malnutrition, pregnancy-related deaths, accidents) and note if there is any clustering of problems or noticeable distribution across the village;
- use brainstorming again to identify some risk factors or conditions, in the household or the community, which participants perceive as likely to have made households vulnerable or to have contributed to the occurrence of the health problems; such factors may include poor sanitation, poverty, crowded living conditions, recent migration, too large or too small household, croplands affected by floods, etc.;
- insert in the map specific symbols to record the location and distribution of these risk factors (see Figure 4.4).

The best length of time for the recall period may take some discussion with the group. In many regions of the world, six months is too short a period of time to reflect seasonally related health patterns. For example, diarrhea is often worst in rainy seasons when ground water contaminates water sources, or meningitis is most common during the Sahelian dry season when dust is blowing in the Saharan harmattan. At the same time,
research has shown that the longer the time period covered by the recall request, the lower the reliability of the information about the reported events.

As shown in Figure 4.4, pictures or graphic symbols can be used to facilitate understanding of the exercise among participants (especially the non-literate ones). As women are often the primary caretakers of the home, risk mapping of vital events and household contingencies may be best carried out by women, especially mothers and elderly women. If
time permits, complementary perspectives about health events and risks can be obtained by conducting the same exercise with different gender, age and status groups (e.g., male elders, adolescents, local men working in migratory occupations such as mines or estate farms, etc.). This can help in discovering differences in health beliefs and behaviors within the community, as well as triangulating results to test their validity.

Risk mapping relies very much on local perceptions about the determinants of health and disease. It is thus a powerful entry point to identify and discuss local (indigenous) medical beliefs and practices, and a challenge to health professionals with limited acceptance of different cultural understandings of health conditions. A medical anthropologist may help the PAR support team to interpret the findings and understand them within their (likely) bio-medical and ‘scientific’ system of reference.

The local point of view expressed by risk-mapping exercises can be compared with conventional epidemiological and health services information from existing documents. This blending of viewpoints may yield a new, integrated perspective on the community health profile and help improve communication between various kinds of health service providers and users.

The support team should facilitate the drawing of connections between the identified health issues and other phenomena and features encountered while assessing the environmental and population situation in the area. In fact, many environmental and demographic features may be health-risk factors in themselves. For instance small-size household plots and poor productivity of the hillside land can be risk factors for child malnutrition and high mortality. Large-size households or seasonal male migration can be risk factors for tuberculosis.

A child nutrition assessment will enable the community to get a grasp on the prevalence of child malnutrition. The standard means of assessing malnutrition is to measure children’s height and weight and compare those among themselves and to average heights and weights of children of the same age in a comparable group of reference (e.g., the country as a whole). In communities where this kind of nutritional monitoring has never taken place (for lack of equipment or trained personnel), the methods presented below can be used to gain an approximate measure of local malnutrition. They also accompany the community into the identi-
Box 4.8

Sample questions for a child health and nutrition survey

1. Did any of your children go to bed hungry over the past year, and if so, which months were the hardest?
2. How many of your children had diarrhea in the past month?
3. Have you taken all of your children for immunizations at the government clinic/during the immunization drive?
4. How do you manage when food supplies run low?
   - Gather food in forest
   - Borrow money/food
   - Take on new jobs to get money
   - Other (explain)

The two methods we describe here are seasonal analysis of food availability and brief, structured interviews with mothers. The seasonal analysis method involves using sticks of varying lengths for each month of the year. Together with a group of villagers, place 12 small stones in a line, each separated by a few centimeters. Having at their disposal sticks that can be broken off for varying lengths, villagers select a long stick and place it close to the month that has the greatest food availability. Then, they place progressively smaller sticks close to months that have less food availability. Typically, the ‘leanest’ month will be just prior to harvest of the new crop. The result is a histogram that visually represents the good and the bad months.

Using this diagram as a basis for discussion, a facilitator can elicit from the participants some of the implications of this seasonal variation for child health and nutrition, the gathering of edible plants in the fields and forests, the spread of infectious diseases and the household coping strategies. This informal discussion can prepare for more detailed interviews involving all (or a sample of) mothers with children under age 10. The questions should be few in number and sufficiently straightforward. Ideally, the members of a ‘mothers of a family’ interest group would be involved in collecting the information. Examples of questions that might be asked can be found in Box 4.8. The responses can be tallied and converted into percentages in order to develop a composite picture for the village, and also by different household characteristics (see Table 4.5).

A better mutual understanding of the dynamic relations between communities and the health services available to them can be facilitated by a strengths, weaknesses, opportunities and limitations (SWOL) analysis.
Table 4.5

Tabulated results of the informal survey ('Amada', 1997)

<table>
<thead>
<tr>
<th></th>
<th>Having children going to bed hungry in 1996</th>
<th>Having children with diarrhea in 1996</th>
<th>Having children fully immunized</th>
<th>Seeking food in forest</th>
<th>Borrowing money or food</th>
<th>Selling labor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of all households</td>
<td>42</td>
<td>65</td>
<td>89</td>
<td>45</td>
<td>75</td>
<td>40</td>
</tr>
<tr>
<td>Percentage of female-headed households</td>
<td>75</td>
<td>80</td>
<td>61</td>
<td>85</td>
<td>65</td>
<td>75</td>
</tr>
</tbody>
</table>

(see Table 4.6 and Annex B, section B.10). Many action research practitioners consider a community SWOL analysis to be a good way to promote a frank discussion of the positive and negative sides of local service availability, linking past experience with desired improvements to be achieved in the near future. As health services are often the subject of sharp and contradictory (either enthusiastic or distrustful) judgment by actual or potential users, the use of this technique is especially effective to investigate the quality of the provided services in specific terms.

As shown by the example provided in Table 4.6, SWOL analysis can help people to systematize their opinion of what is good or bad in service delivery, to identify what improvements can reasonably be requested from the providers and to see what external constraints could be expected. The SWOL approach can also be useful for helping communities to think about potential solutions to local problems. Obviously the SWOL approach can be used to analyze other kinds of services besides health, such as forestry extension, education or agriculture.

There are some potential difficulties in the implementation of a SWOL exercise. Good facilitation, for instance, is essential for managing the sensitive issues that may arise. In fact, SWOL exercises are usually easier to conduct with homogeneous groups.

**Gender analysis focusing on reproductive issues**

In addition to biological differences, men and women in every culture have different roles, needs and responsibilities in fertility control, reproduction and child-rearing. These gender-based differences can vary from country to country, depending on traditions and on social, economic and environmental conditions.
Table 4.6
Example of SWOL matrix on health service provision (‘Amada’, 1997)

<table>
<thead>
<tr>
<th>What is working well? (strengths)</th>
<th>What is not working well? (weaknesses)</th>
<th>What can be improved? (opportunities)</th>
<th>What will prevent the improvement? (limitations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The nurse comes now twice a month</td>
<td>If somebody is sick when the nurse is not around, we have to bring him to town</td>
<td>Some medicine can be left with the teacher in case of emergency</td>
<td>The nurse is not willing (or cannot) do that</td>
</tr>
<tr>
<td>Some medicines are given for free</td>
<td>Often medicines are not available</td>
<td>Buy medicines in town and stock them in the village</td>
<td>We cannot afford to buy expensive medicines</td>
</tr>
<tr>
<td>Vaccines for children are available</td>
<td>Nobody knows when the vaccination team is going to come</td>
<td>The community could be informed by radio</td>
<td>Nothing</td>
</tr>
<tr>
<td>We have been taught how to prepare oral rehydration solution (ORS) to treat babies with diarrhea</td>
<td>Giving ORS takes a lot of time</td>
<td>Elders’ daughters should be taught</td>
<td>The school teacher does not want somebody else to teach her pupils</td>
</tr>
<tr>
<td>We understand why safe water and latrines are important</td>
<td>Boiling river water requires a lot of firewood</td>
<td>A machine to squeeze sugarcane would help</td>
<td>Who is going to buy it?</td>
</tr>
<tr>
<td></td>
<td>Digging latrines is hard work</td>
<td>We could ask the District Administration to build a piped water scheme as in Red Bank</td>
<td>We don’t have friends in the District Administration</td>
</tr>
</tbody>
</table>

Gender analysis is a method used for identifying and discussing the most important features of male and female roles within the local culture. This method can be applied for assessing gender divisions of labor, gender-specific knowledge and practices related to natural resources management, and reproductive behavior. Its use is especially recommended, in the framework of this manual, for all those mentioned aims, as well as
Gender analysis is a method for identifying and discussing the most important features of male and female roles within the local culture for appraising existing knowledge, attitudes, needs and expectations related to fertility, reproductive health and family planning. It is also recommended that, wherever possible, a gender-based collection of information and analysis is carried out for the prior environmental, population and health profiles. Here we will focus on reproductive issues to provide an example of how this can be done.

In most rural communities, relationships between men and women, sexual behaviors and beliefs, and practices related to conception, pregnancy and delivery are extremely sensitive issues. Applying a gender analysis to these topics requires a good understanding of local culture and well-developed facilitation skills. A satisfactory outcome to this exercise is more likely if it is not attempted until the participatory process is going well and a smooth relationship has been established between insiders and outsiders.

Facilitators of gender analysis exercises will need to practice some cultural relativism, i.e., they will need to put aside their own ideas about how men and women ‘ought to’ relate to each other. Outsiders need to be prepared to accept beliefs and behaviors which may be very different from their own. For example, insistence on promoting equality in women’s conditions with respect to men’s can be resented and disrupt the process of community-based exercises, unless such a need is clearly spelled out by the locals themselves.

On reproductive knowledge and behavior, the principal actors could be small gender-based interest groups supported by a facilitator of the same gender (e.g., five to six women with a female facilitator, a similar group of men with a male facilitator). In many regions of the world, traditional culture, especially in rural areas, subordinates female involvement in public settings, such as meetings. Dividing men and women into separate groups for discussion can be an effective way of coping with this social norm. In a separate group, women can have the opportunity to organize their thoughts, prepare their own presentations and refine their opinions and wishes before meeting again with men. In this way, gender-separated groups can help ensure that women’s insights are integrated into the discussions of the entire community.

There are two basic methods, suggested for gathering and appraising information, which are specifically relevant to a gender analysis of reproductive behavior:
Box 4.9

Example of reproductive history interview guide

1. How old are you?*
2. How many sons and daughters were born from your marriage(s)?
3. Are they all alive?
4. Have you ever suffered an abortion?
5. Have you had a birth in the last two years? (for women aged 15–45 only)
   • If yes, when did your most recent previous child birth occur?
6. Is there anything a women can do to prevent conception?
7. Have you ever practiced contraception? When?
   • If yes, are you currently practicing modern contraception?
8. Do you wish to delay your next pregnancy? (for women aged 20–45 only)
9. Do you wish to stop bearing children entirely? (for women aged 30–45 only)

* If exact age is unknown, an estimate based on physical appearance and/or historical events experienced by the informant can be made.

• semi-structured interviews on reproductive history;
• focus group interviews.

Women’s reproductive history obtained through semi-structured interviews (see Annex B, section B.6) can be useful for collecting basic quantitative information on numbers of pregnancies, deliveries, potential problems, etc. These interviews are generally best carried out by literate members of the female interest group. While the ideal respondents for these interviews would be elderly women, there may be substantial differences in reproductive values and behaviors between generations of women. Therefore, a sample of female informants representing different age groups is suggested, e.g., some adolescents, some young women, some middle-aged and some elderly.

Examples of interview guides and summary forms are presented in Boxes 4.9 and 4.10. Organizing quantitative data in simple summary forms may help to identify locally useful indicators of reproductive behavior. The next step is tallying (consolidating) the data to look for patterns in the community (see Box 4.13).

Focus group interviews (see Annex B, section B.5) are an appropriate strategy for eliciting women’s and men’s expectations, attitudes and needs with respect to fertility and parenting. They can provide qualitative data useful for interpreting the quantitative data collected from reproductive histories. A couple of cautions about focus groups: 1) the facilitator
Box 4.10

Example of completed reproductive history interview summary form.

<table>
<thead>
<tr>
<th>Informant:</th>
<th>Kapuchka</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Amada</td>
</tr>
<tr>
<td>Date of interview:</td>
<td>16 September 1994</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>Mary</td>
</tr>
<tr>
<td>Informant's age:</td>
<td>+/-65</td>
</tr>
<tr>
<td>Number of sons</td>
<td>4 (1 of whom died in the civil war)</td>
</tr>
<tr>
<td>Number of daughters</td>
<td>3 (1 of whom died when she was a baby)</td>
</tr>
<tr>
<td>Number of abortions</td>
<td>2 (both spontaneous)</td>
</tr>
<tr>
<td>Known contraceptive means</td>
<td>Use of indigenous contraceptive</td>
</tr>
<tr>
<td>Practice of contraception</td>
<td>For several years (since before first husband’s death)</td>
</tr>
</tbody>
</table>

will need sensitivity in discussing sexually related topics in most communities; and 2) there will be a need for analytical skill in extracting the key points from the large amounts of data likely to be generated. Training and practice with the support of an experienced facilitator can help to conduct the interview and to process and consolidate the raw data.

In a small village, two focus groups, one of five to ten males and the other of a similar number of female participants, should be sufficient to obtain a reasonably representative view of insiders’ perceptions of fertility and parenting. The participants should be adult, married persons with some parenting experience. This perspective could be enhanced by obtaining opinions and perceptions also from adolescents and from elders.

Table 4.7 provides an example of a focus group interview guide (and a sample of hypothetical responses from two groups) for an exercise on expectations and attitudes on fertility and parenting. The results are a composite of replies from real settings, showing a plausible set of concerns from women and men in a rural community.

The final results of a gender analysis on reproductive health and fertility can be communicated to a broader community audience for review and discussion. Care should be taken to maintain a strict anonymity of sources. The local situation will influence whether to hold separate feedback meetings by gender, or report on the results in a general meeting. Although comparing the results from male and female groups could create a delicate situation, it can also be useful in identifying possible gaps and inconsistencies, and help to elicit any felt needs about changing the situation. To make the meeting more effective, the support team could prepare a list of questions to promote discussion and orient the meeting towards action (see Box 4.12).
**Box 4.11**

**Example of reproductive histories:**

*Consolidated Information Form ('Amada', 1997)*

<table>
<thead>
<tr>
<th>Number of women interviewed</th>
<th>10 (five over 50 years of age; five aged 20–45)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of children born for each woman over 50</td>
<td>6</td>
</tr>
<tr>
<td>Average number of children born for each woman 20–45</td>
<td>3</td>
</tr>
<tr>
<td>Average number of children lost for each woman over 50</td>
<td>3</td>
</tr>
<tr>
<td>Average number of children lost for each woman 20–45</td>
<td>0.2 (1 for every 5 women)</td>
</tr>
<tr>
<td>Average number of abortions for each woman over 50</td>
<td>3</td>
</tr>
<tr>
<td>Average number of abortions for each woman 20–45</td>
<td>0.4 (2 for every 5 women)</td>
</tr>
<tr>
<td>Average birth interval for women 15–45 who have given birth in the past two years</td>
<td>30 months (with a range from 12–80 months)</td>
</tr>
<tr>
<td>Proportion of women over 50 who have ever used indigenous contraceptives</td>
<td>4 out of 5</td>
</tr>
<tr>
<td>Proportion of women 20–45 who wish to delay childbearing</td>
<td>3 out of 10</td>
</tr>
<tr>
<td>Proportion of women 20–45 who wish to stop childbearing</td>
<td>1 out of 10</td>
</tr>
<tr>
<td>Proportion of women 20–35 who have ever used indigenous contraceptives</td>
<td>1 out of 5</td>
</tr>
<tr>
<td>Proportion of women 20–35 who have ever received modern contraceptives from the clinic</td>
<td>1 out of 5</td>
</tr>
<tr>
<td>Proportion of women currently using modern contraceptives</td>
<td>1 out of 20</td>
</tr>
</tbody>
</table>

**Box 4.12**

**Gender analysis: comparing data from men and women**

After the presentation of the gender analysis of reproductive issues, the following questions can help the support team to guide a discussion that engages the voices of both genders for the good of the community.

**General:** Were the ideas of the men and women different? In what way?

**Men:** What are the main problems of women regarding fertility and reproduction? What do they think about these problems? What can be done about it?

**Women:** What are the main problems of men regarding fertility and reproduction? What can be done about it?

**General:** What can be done by the whole community for the benefit of all?

*Adapted from: Bergdall, 1993*
Two mothers stated that they felt the problem of high child mortality was due to children being born too soon one after the other. The reproductive history interviews revealed that over one-third of recent births occurred two years or less after the birth of the previous child. It is not uncommon, according to the women of ‘Amada’, for a child to be weaned early because the mother becomes pregnant again. Thus, closely spaced children compete with one another for adequate nutrition, and for their mother’s attention. They also leave mothers increasingly tired and unable to perform other household tasks. Some women blame the close spacing of births on a breakdown in the rules governing postpartum abstinence – the traditional 16–18-month period following the birth of a child during which couples abstained from sexual relations.

In the minds of the villagers the prevailing desire for large families is partly related to the problems of infant and child mortality. A number of parents commented during the gender analysis that “we have many sons and daughters so that a few will survive and support us in our old age.” The gender analysis also revealed that only 20 percent of women aged 20–45 have ever practiced modern family planning, and that, of the 40 percent of women of reproductive age who would like to limit or space their births, only 5 percent were currently using a modern form of contraception. This represents a significant level of unmet need for family planning services. When probed, a number of women indicated that they would like to practice modern family planning, but that they do not have time to travel to the clinic in the closest town, which takes some hours, only to wait there another hour or two for services. They also stressed that some husbands objected to their wives being visited by a male doctor, and that others didn’t want to limit fertility because more children meant more hands to help with household chores.

This hypothetical summary of findings shows how, through discussions among different interest groups and joint analysis of the collected data, the interrelations between the community’s environmental, health, and population issues often become clear to the PAR participants. Although the focus of the analysis of the appraisal’s results may remain on problems, some interest group members will undoubtedly start to think about how the community might begin to address these problems. In the next steps, interest groups can use a set of tools to more systematically identify ‘solutions’ and potential actions.
Problem-cause-effect trees

Building a tree of problems, causes and effects is a simple and widely comprehensible visual technique. It enables an interest group to summarize the findings of participatory appraisal exercises and orient itself toward actions based on those findings.

The technique starts with a brainstorming aimed at reaching a consensus within the group on what is the main ‘problem’ identified by the appraisal exercise. A facilitator in this exercise (e.g., a member of the PAR support team) will need to remember that definitions and linkages of problems-causes-and-effects may be interpreted in several ways. The ‘problem’ for a development professional (e.g., soil erosion) could be a ‘cause’ for a community member (e.g., of the problem of declining yields) and an ‘effect’ for a scientist researcher (e.g., of the problem of deforestation and cultivation on steep slopes). A second reminder is that lack of formal education does not mean lack of analytical thinking, although special attention to visual methods may be needed for supporting some community members to express their own views.

The exercise can be started off by posing a question such as:

What is showing up as your main concern/problem based on our participatory research?

Such an entry is more appropriate than an attempt to define some analytical categories (i.e., cause, problem, effect). If definitions become necessary, they can be agreed upon at a later stage in the work.

Once the main problem is identified, the facilitator can create a large outline sketch of a tree (e.g., on a blackboard or a flipchart) that shows its trunk, roots and branches (see Figures 5.1 a–c). By writing the problem on the trunk (graphic representation can be used if participants are non-literate), he/she explains that, in this diagram, the roots represent the causes of the problem and the branches its consequences. Further brainstorming (see Annex B, section B.7) is then carried out among the participants in the exercise to list their perceptions about the ‘roots of the problem’ and its consequences (branches) and plot them on the tree diagram:
Case Example 5.1  
Participatory Research and Planning in St. Lucia

In 1981, a project entitled Conservation and Development of the South Coast of St. Lucia was initiated by the Eastern Caribbean Natural Area Management Program (ECNAMP, now known as the Caribbean Natural Resources Institute, CANARI). Up until that time there had been awareness of the intrinsic value of natural resources in the area, including mangroves, coral reefs, sea grass beds and xerophytic forests, but there had been no systematic inventory to support a unified effort at conservation.

The project’s new Advisory Committee began its work with the coordination and supervision of a survey of conservation and development requirements for the south-east coast. The committee comprised representatives of all relevant governmental and non-governmental institutions, as well as several members of the community.

The survey represented a classical physical planning exercise, with data gathering; analysis of issues, constraints and opportunities; definition of management alternatives; and formulation of development and resource management plans. The exercise, however, included four characteristics that differentiated it from most undertakings of this nature:

1. The planning study was conceived and undertaken as an instrument of education and public awareness. School groups were involved in data-gathering, analysis and decision-making exercises; information was disseminated to schools in the area; and field-based educational activities were collectively designed and supported.

2. The study was also designed to facilitate community participation at all stages of planning by involving resource users in data gathering, using local knowledge, redistributing research results and encouraging participation in analyzing and formulating recommendations.

3. The involvement of agencies and institutions at the national and local levels was encouraged through their participation in the project Advisory Committee, but also through more specific consultations and reviews of individual project chapters and recommendations.

4. Whenever possible, the project encouraged implementing certain recommendations even before the completion of the overall plan. This was seen as important to maintain the momentum that the participatory approach to the exercise had created.

One area of immense value to the project was the appreciation of popular and traditional management techniques, which were demonstrated to be relevant to modern needs. In particular, this knowledge proved essential for the management of mangroves and sea urchins. The project adapted its management techniques to local conditions by seeking the guidance of residents and resource users who participated in the decision-making.

Another major benefit of participatory planning was the recognition of community needs by governmental and non-governmental agencies. This recognition generated an understanding that conservation efforts must include local development concerns if they are to receive community support. As a result of the participatory process, decisions were easier to implement, because there was strong commitment to the project and the community was willing to allocate human and financial resources to make the plan work.

From: Renard, 1994
What are the main roots or causes of the problem?

What are its most important consequences?

Participants can also be asked to consider 'perpetuating' or 'constraining' practices, i.e., problems brought about by some form of human behavior or activity.

During the exercise, a renegotiation may take place within the group about what is – really – the main problem at stake. If this happens, amendments can be jotted on the diagram by the facilitator. Once a final agreement has been reached by the group about the core problem and a discussion about causes and effects has warmed up, external inputs (e.g., reminders based on the appraisal exercise data or ideas coming from technical resource persons) may be introduced by the facilitator and discussed with the group. In this activity, the facilitator should take care to keep the discussion centered around concerns, topics and language that are well understood by all the participants.

Identifying ‘solutions’ and potential actions

Once the diagram is completed, the discussion can move on to explore possible ‘solutions’ to deal with the causes and consequences of the problem. The purpose is to raise participant awareness that different levels of solutions can be forwarded for dealing with any single problem. This can also help participants to understand that the final decision about what to do will involve a trade-off between higher effectiveness (which usually comes from attacking the very root causes of the problem) and easier or faster generation of some specific results (which may alleviate or control some effects and consequences of the problem on daily life, even if they do not tackle the problem itself). Finally, a discussion of possible ‘solutions’ may help sensitize participants to the fact that many, if not most, of them are unlikely to be managed alone by a small interest group – other actors within and outside the community will need to collaborate for a proposed solution to succeed.

In contrast to ‘solutions’, which represent general objectives for addressing the problems identified in the trees, ‘actions’ can be defined as specific tasks that need to be carried out to reach those objectives. A support team member could ask the members of the interest group what actions they feel ready and able to put into practice within the next 12 months.
Problem-cause-effect tree diagram ('Amada', 1997)

Interest group 1: Mothers interested in the health and nutrition of their young children

- Too many children to feed and care for, no time for women to generate income or rest
- Women seek uprooted in the village
- Women become ill and tired after too many pregnancies
- Too many women die because of abortion and delivery
- An ambulance be made available for emergencies
- Too many pregnancies, abortions and deliveries
- Abstinence is not a popular practice with either men or women
- Most people in the village do not know how to prevent pregnancies
- Many do not understand what the family planning doctor suggests
- Men do not like their wives to attend the family planning clinic, become the doctor may have to touch their sex
- Need person from the village be trained as mother and child health nurse
- Mother and child health nurse seldom available
- A woman doctor be placed in charge of the family planning clinic
Figure 5.1b

Problem-cause-effect tree diagram ('Amada', 1997)

Interest group 2: Farmers interested in preventing hillside erosion and flooding
Figure 5.1c

Problem-cause-effect tree diagram ('Amada', 1997)

*Interest group 3: Young men interested in income generation and employment opportunities in the village*

[Tree diagram showing the relationships between various issues such as lack of income opportunities, persistent poverty, and solutions involving migration, education, and employment opportunities.]
Table 5.2

Example of a potential partners matrix ('Amada', 1997)

<table>
<thead>
<tr>
<th>Potential partner</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>What can they offer?</th>
</tr>
</thead>
<tbody>
<tr>
<td>District Public Health Service</td>
<td>The new district health officer is committed to improving outreach to communities</td>
<td>Health personnel at the clinic in the nearest town are often rude to clients and make them wait</td>
<td>Training services&lt;br&gt;Some medications and contraceptives</td>
</tr>
<tr>
<td></td>
<td>A mobile health service has been employed for vaccinations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Ministry, District Office</td>
<td>A few well-qualified and motivated extension agents</td>
<td>Many of the personnel do not make sufficient field visits</td>
<td>Training in terracing and intercropping (fruit trees and food crops)&lt;br&gt;Low-cost fruit tree seedlings</td>
</tr>
<tr>
<td></td>
<td>Has a good experimental farm for testing new crop varieties and producing improved fruit tree seedlings</td>
<td>Staff morale is low, partly due to government inability to pay salaries on time</td>
<td></td>
</tr>
<tr>
<td>Forestry Agency</td>
<td>New grant from UNDP means that they are currently well funded and equipped</td>
<td>Programmatic emphasis on timber production in state forests, not on community needs</td>
<td>Tree seedlings&lt;br&gt;Training in forestry management and for creation of village nursery</td>
</tr>
<tr>
<td>Environment and Development NGO</td>
<td>Has offices in the district capital&lt;br&gt;Has worked with neighboring villages on development initiatives with apparently good results</td>
<td>Under-funded and under-staffed for the number of ongoing projects</td>
<td>Technical know-how and support to PAR follow-up&lt;br&gt;Support to youth-led development efforts</td>
</tr>
<tr>
<td></td>
<td>Committed to community participation, and has worked with youth.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Has anyone attempted a similar initiative in the past?
- What have been the reasons for past successes with similar initiatives?
- What have been the causes of past failures?
What can this particular constituency (interest group or community) do to ensure the success of the initiative in the future?

Must anyone else be involved?

The discussion can be systematized and displayed by means of feasibility matrices. These are tables in which horizontal rows are used for social actors and vertical columns are reserved for responses to a standard set of questions. A simple feasibility matrix can include rows for the interest group and the other actors identified as concerned and capable of playing an active role. Columns can make reference to a few key questions, such as:

- What contributions should they make? Examining and answering this question for each row (interest group, community as a whole, local institutions, external agencies, etc., as appropriate) provides a list of tasks and responsibilities anticipated for each social actor, including an indication of the resources that have to be mobilized, the needed attitudinal changes, acquisition of skills, etc.

- What benefits will they get in the short run? Answers to this question for each row in the matrix will provide a list of short-term benefits or immediate results which can motivate the different social actors to implement the action.

- What should they do to ensure a long-lasting solution? Answers to this question will elicit the efforts that will be necessary by each concerned social actor to maintain the immediate results in the long run. This question addresses concerns about sustainability of positive results, learning from past experiences of success and failure, monitoring to keep the action on track and responsive to local conditions, etc.

- What benefits will the solution bring to them in the long run? Answers to this question will help to identify the possible long-term consequences of the solution. Exploring this question can uncover expectations of side benefits or potential constraints, e.g., job opportunities, or loss of access to resources that have not yet been mentioned.

Depending on the degree of sophistication at which the analysis needs to be conducted, more columns and rows can be added to this simple scheme. In the case of actions which propose to generate direct income, a column can be created on the matrix to assess anticipated monetary
Table 5.1c
Completed action identification matrix (‘Amada’, 1997)

*Problem: Lack of income opportunities in the village*

<table>
<thead>
<tr>
<th>Effects and causes to tackle</th>
<th>‘Solutions’</th>
<th>Potential actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youth leave the village to find jobs in the cities</td>
<td>Create jobs in the village</td>
<td>Establish forest product enterprises</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish a fish processing business</td>
</tr>
<tr>
<td>Lack of capital to start new initiatives</td>
<td>Establish a Rotating Fund for new enterprises</td>
<td>Collect fees and agree on rules among participating people</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Obtain a matching grant from some development NGO</td>
</tr>
<tr>
<td>Lack of training opportunities</td>
<td>District provides training opportunities</td>
<td>Visit the district administration offices and other relevant institutions and obtain training fellowships for at least 10 young men and women (on skills to process and commercialize fish and non-timber forest products)</td>
</tr>
</tbody>
</table>

The facilitator can start the exercise by drawing a small circle to represent the interest group, and then surrounding it by a bigger circle representing the community. Participants are then asked to identify other social actors (for instance, informal age- and gender-based groups, kinship groups, traditional and recently introduced community institutions, extension workers, missions, NGOs, etc.) likely to be concerned or willing to act on the issues at stake. Next, participants can represent those named groups with cut-out circles of various sizes and place those circles on the diagram to represent their close or distant relationships with the interest group. The facilitators will stress that this is not a map of physical location, but a picture of social influence, as it applies to the specific problem being discussed.

The group will need to decide about the size of the circle for each social group or actor (which represents the relative importance of that actor in the perception of the participants) and whether to place it inside, outside or overlapping the community circle. Overlapping of circles is used to show the existence of direct linkages among social actors. Using colors or graphic codes (e.g., stars, pluses or minuses) may help in showing the
influence of each actor relative to the topic under consideration. As with other participatory exercises, drawings (e.g., pictographs or symbols) can substitute written words if the participants are non-literate.

The Venn diagram is helpful for visualizing a discussion of insider/outsider relationships, but it may prove even more useful to go a step further by conducting a candid assessment of the strengths and weaknesses of potential partners in given actions (e.g., local government, line-agencies of the central government, NGOs and development or conservation projects existing in the area). Table 5.2 shows a matrix of potential partners in which each one is assessed according to its strengths, weaknesses and what it can offer. It is not necessary to develop a matrix, but matrices are generally useful to record and discuss information.

**Analyzing the feasibility of potential actions**

Once a realistic assessment of the local partners has been completed, a feasibility analysis of possible actions can be undertaken. The following questions may be useful:
Table 5.1a

Completed action identification matrix ('Amada', 1997)

Problem: Too many pregnancies, abortions and deliveries

<table>
<thead>
<tr>
<th>Effects and causes to tackle</th>
<th>‘Solutions’</th>
<th>Potential actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too many women die from abortion and delivery</td>
<td>Improving mother and child health care</td>
<td>Set up a solidarity fund for pregnant women to pay for a car in case of emergencies</td>
</tr>
<tr>
<td>Health and family planning services sporadic or distant and not acceptable for the community</td>
<td>Making family planning services more accessible and acceptable</td>
<td>Train a young literate woman from the community in mother and child care and family planning and set up a small fund to support her work. Entrust to a woman doctor the mother and child care and family planning outreach program for the community</td>
</tr>
<tr>
<td>Women have no time for themselves</td>
<td>Setting up a child care center in the village</td>
<td>Ask young women to keep and feed children (this does not appear feasible, as there is no such tradition in the village and mothers have no money to spare)</td>
</tr>
</tbody>
</table>

Longer or shorter time periods may be considered, but this period is generally useful to identify realistic and practical objectives. Also, if the interest group needs other actors to contribute, who are those actors?

During this brainstorming, an action identification matrix (drawn on a flipchart or chalkboard) can be used to jot down the key elements of the participants’ suggestions. Examples of this type of matrix are shown in Tables 5.1 a–c, each of which illustrates a plausible outcome to this exercise.

The list of potential actions provided in Table 5.1a shows how participants may suggest different ways of achieving the same result (e.g., better health and family planning services). In fact, among the potential actions identified by the PAR participants there may be a number of good ideas, but further analysis is usually required to understand what is effective and feasible.
### Table 5.1b

**Completed action identification matrix (‘Amada’, 1997)**

**Problem: Hillside erosion and irregular river flow**

<table>
<thead>
<tr>
<th>Effects and causes to tackle</th>
<th>‘Solutions’</th>
<th>Potential actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of crop land along river banks</td>
<td>Building dikes and de-silting river bed</td>
<td>Obtain technical assistance on the construction of dikes and other means for de-silting river beds. Organize village men to work together</td>
</tr>
<tr>
<td>Deforestation on hillsides</td>
<td>Reforestation of the hills</td>
<td>Replant anti-erosion trees on the sides of Blue, Black and Yellow Hills Revitalize forest management committee and forbid tree cutting and grazing, so that natural regeneration can take place</td>
</tr>
<tr>
<td>Lack of soil protection measures</td>
<td>Building terraces in household plots</td>
<td>Get training and advice on how low-cost terraces can be built</td>
</tr>
<tr>
<td>Need to clear land for agriculture on upland slopes</td>
<td>Increase yields in existing plots Stop land fragmentation because of large number of children in a typical family</td>
<td>Purchase collectively two oxen and some high-quality seeds (not feasible without a well-functioning village committee) Begin using family planning methods</td>
</tr>
</tbody>
</table>

### Analyzing the community organizational and institutional context

Visual exercises can be used by interest groups to show their perceptions of the various social actors who might present obstacles or contribute to a given course of action. In particular, Venn diagrams (sometimes called *chapati* or pancake diagrams) are used to elicit and portray sets of insider/outsider relationships for a community, including decision-making power and external influences. As shown in Figure 5.2, Venn diagrams can also focus on the linkages among the actors to be involved in carrying out a specific activity.
costs and benefits for the various involved persons or groups (at times called stakeholders). Such a column could explore prospects for finding markets or buyers, reasons to expect that sales would exceed expenses, etc.

This exercise allows the interest group to assess the effort that will realistically be required to achieve the ‘solution’ they would like to pursue, as well as the potential conflicts of interest that could arise during the implementation phase. Tables 5.3 a–c show examples of filled-out matrices for three interest groups in ‘Amada’. Besides summarizing the group discussion, matrices such as these can be useful to illustrate the initiative and to motivate other actors, within and outside the community, to contribute to it.
### Table 5.3a

#### Example of a feasibility matrix ('Amada', 1997)

**Example 1:**  
**Interest group:** Mothers with young children  
**Problem:** Their poor reproductive health  
**Action:** Training and supporting a young woman from the community as a mother-and-child-care and family planning nurse

<table>
<thead>
<tr>
<th>Responsible actors</th>
<th>What contributions should they make?</th>
<th>What benefits will they get in the short run?</th>
<th>What should they do to ensure a long-lasting ‘solution’?</th>
<th>What benefits will the solution bring to them in the long run?</th>
</tr>
</thead>
</table>
| **Interest group** | Spread the idea among other women and men of the community  
Identify candidates for training  
Support the family of the selected candidate during her absence | Treatment and prevention of our own and our children’s illnesses  
Family planning advice and care by a person aware of our needs and problems  
Less trouble with our husbands about sex and pregnancy | Support our nurse in her daily activity, by means of voluntary work  
Advise her with our knowledge and experience | Better prevention and treatment of disease  
Better control of pregnancies and deliveries  
Increased capability to prevent undesired pregnancies |
| **Community at large** | Appoint candidates for training  
Support the project with the District Health Authorities  
Commit to build a suitable health post through communal work | As above | As above | As above |
| **District Health Services** | Find a scholarship for our candidate  
Provide equipment and supplies for when she will start to work in the community | They will be enabled to provide a good service at low cost  
Community will understand better how to deal with health, disease and pregnancies and thus will be more supportive | Give a part-time salary to the nurse  
Give her advice and orientation in her work  
Coordinate with her whatever activity is to be carried out in the community | Increased concern of the community for health and health services issues  
More participation in health sector activities |
Example of a feasibility matrix ('Amada', 1997)

**Example 2:**  
**Interest group:** Owners of river bank plots  
**Problem:** Erosion of land by river flow  
**Action:** Setting up flood control measures (dikes, de-silting of river bed)

<table>
<thead>
<tr>
<th>Responsible actors</th>
<th>What contributions should they make?</th>
<th>What benefits will they get in the short run?</th>
<th>What should they do to ensure a long-lasting 'solution'?</th>
<th>What benefits will the solution bring to them in the long run?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interest group</strong></td>
<td>Time and labor supporting technicians and implementing erosion control works along the river (dikes and de-silting) Help in constructing upstream water retention dam</td>
<td>Learning how to do effective erosion control works in our field Learning how to create small-scale engineering works River sediments can be used to improve the soil</td>
<td>Regular de-silting as necessary</td>
<td>Loss of land due to river bank erosion will decrease and potentially stop altogether Interruption of flooding may be negative for some crop yields (undesired consequence)</td>
</tr>
<tr>
<td><strong>Community at large</strong></td>
<td>Support for our initiative from the mayor and the community council</td>
<td>As above</td>
<td>Institute a flood control committee, who will review flood works periodically</td>
<td>Enhanced safety and constancy of production</td>
</tr>
<tr>
<td><strong>Public Works Department</strong></td>
<td>Technical support by a qualified engineer Material and equipment made available at a low price</td>
<td>Provincial supervisor will be happy to see that the local staff are working with communities (and not just sitting in their offices)</td>
<td>Assistance should be given until a suitable flood control measure is successfully tested in the community</td>
<td>Example of successful collaboration between communities and government agencies</td>
</tr>
</tbody>
</table>
### Example of a feasibility matrix ('Amada', 1997)

**Example 3:**

**Interest group:** Landless young men  
**Problem:** Lack of income opportunities in the village  
**Action:** Create income opportunities by establishing businesses on processed natural resources

<table>
<thead>
<tr>
<th>Responsible actors</th>
<th>What contributions should they make?</th>
<th>What benefits will they get in the short run?</th>
<th>What should they do to ensure a long-lasting ‘solution’?</th>
<th>What benefits will the solution bring to them in the long run?</th>
</tr>
</thead>
</table>
| **Interest group** | Willingness, commitment and hard work  
Raising a sum to establish a Rotating Fund | Increased knowledge about resource management  
Confidence from undertaking something that will yield benefits to themselves and the community  
Modest income | Respect rules in fund repayment  
Consolidate the new enterprises | More income security  
The opportunity to stay in the village |
| **Community at large** | Elders to educate youth about past management systems (NTFPs and fish)  
Patronage and support for new enterprises | Young men staying in the village instead of migrating to urban areas  
Young women will be able to have their husbands stay within the village  
Better resource management | Have a representative of youth sit on the village council  
Grant the young men the right to harvest some forest resources in return for the responsibility for their management  
Allow building of artificial ponds for fish farming | Greater dynamism in the village from having young men stay and developing enterprises |
| **Forestry Department** | Dedicate a trained resource person to work with the young men on forestry enterprises | Greater experience in community-based forest management | Keep providing support upon request | Better appreciation of community needs  
Improved relationship with local people |
| **Environment and Development NGO** | Dedicate a trained resource person to work with the young men on harvest and processing of NTFPs and on fish farming techniques  
Provide a matching sum for the Rotating Fund | Active involvement in sustainable development enterprises that are genuinely community-based | As above | Good funding possibilities from external donor to support this kind of work |
5.3 Negotiating and agreeing upon a plan

At this stage the PAR process should have achieved several results:

- an assessment of the local environment, population dynamics and health situation in the community at stake;
- the identification and consolidation of interest groups through common work on participatory appraisal and analysis of specific problems and ‘solutions’ to address them;
- the identification of key potential partners from inside and outside the community and their potential roles in addressing the community’s concerns; and
- communication and discussion about the appraisal and analysis with all community members and interest groups, and prioritization of actions to pursue.

It is now time to:

- contact the relevant potential partners and jointly negotiate a plan to implement the priority actions agreed upon by the community.

Workshops are appropriate methods to carry out this last step. Indeed, experience in participatory action research has shown that a structured discussion on specific issues of common interest, supported by a sensitive and diplomatic preparation and a shared information base, is likely to lead to mutually agreeable ‘solutions’. Suggestions for organizing, designing and implementing such a workshop are provided below.

**Recruiting participants and organizing the workshop**

In principle, it is desirable to involve in a participatory planning workshop a variety of social actors, both internal and external to the community. Besides the interest groups that participated in the PAR process, this may include the community leadership and various partner institutions with a stake in the natural resources or economic development, education, health services, etc., as appropriate. For ensuring real participation and keeping group dynamics under control, it is advisable that not more than about 30 persons take active part in the event.

Keeping the planning workshop to a manageable size means that all the potential partners should be encouraged to identify suitable representatives. Ideally, each would be represented by the same number of delegates.
reasonable approaches to the identification of representatives could be designation (appointment), election or volunteering (two to four) so that a numerical balance is maintained. Depending on the internal structure and dynamics of the various groups, reasonable approaches to the identification of such people could be designation (appointment), election or volunteering. In any case, groups and institutions need to be encouraged and allowed to make their own selections, provided that the chosen delegates are entitled to a reasonable amount of negotiating power and authority on behalf of the group. Otherwise, their contributions could later be discounted or de-legitimized.

In some cases, it may be difficult to obtain the necessary support from government agencies, which may need to be persuaded to send a representative to the planning workshop. The support team may play a useful role in convincing local agencies of the importance of assisting communities in participatory appraisal and planning exercises, and of the need for their full support.

To ensure actual involvement of every participant and proper interchange of ideas, the design of the workshop should be based on a balanced mix of small group activities and plenary discussions. A possible list of activities to share information and elaborate a joint plan in the workshop is presented in Box 5.1. Further general suggestions include the following:

- **The community is in charge of organization and logistics.** Even if an external budget is available, equitable cost-sharing by the community is recommended. Local residents might be able to assist with a venue, contributions of food and cooking fuel, help with cooking, etc. Most of all, the workshop should be ‘owned’ by the community and the PAR support team must make clear that they are present to assist, but they are not in charge. One or more local persons should be designated focal points for organization and logistics.

- **Finalize in advance a ‘procedural’ understanding.** This is an understanding among all the expected participants and chairing persons covering the workshop objectives, agenda, duration, organization, logistics and criteria for the selection of participants.

- **Plan the workshop’s timing and schedule carefully.** The length of the workshop might vary according to the number of topics to be discussed, the number of participants and the methods to be employed. As a rule of thumb, a participatory planning workshop should not last
Box 5.1

**Possible program for a two-day participatory planning workshop**

*First day – morning*

**Opening ceremony:**
Local authorities and/or religious leaders as appropriate

**Plenary session:**
Explanation of the agenda by the chair and introduction of the facilitators and/or resource persons, as appropriate (members of the PAR support team may play some of these roles)

**Plenary session:**
Presentations and discussions of the results of the participatory appraisal and analysis (problems, opportunities) and of the remedial actions prioritized by the community.

*First day – afternoon*

**Work in small groups:**
Formation and organizing of work space for the small groups, each dedicated to one specific action to be implemented. Each group is composed of the expected partners in the implementation of the action.

Personal introductions and statements of desired results by all small group participants.
Illustration of proposed solutions and actions (discussion of action matrices, Tables 5.1 a-c)

*Second day – morning*

**Work in small groups:**
Discussion of actions in detail, in particular regarding feasibility, potential conflicts, timings and divisions of tasks and responsibilities (possible discussion of feasibility matrices as in Table 5.3a-c and planning matrices as in Table 5.4a-c)

*Second day – afternoon*

**Plenary session:**
Presentation of the results of the work in small groups by the group spokespersons, and discussion by all participants.

Process comments by member of PAR support team

Summary of results by chair of workshop, with indication of expected next steps and accomplishments in the future

Group evaluation of the workshop

**Closing ceremony:**
Authorities, refreshments, etc.

less than half a day nor more than three days. A weekend or any locally acknowledged rest day during the week can be appropriate for maximizing attendance by various representatives. In some situations, it works well to break the workshop program into two sessions,
interest group that proposes a certain ‘solution’ will be appropriately matched with institutions that have mandate and capacity to deal with the subject
different environmental and population issues, as well as the need to coordinate efforts among various government agencies, local interest groups and other actors.

Negotiating a suitable course of action

Once a common information base is shared among all the participants, small working groups are the most appropriate way to discuss the proposed solutions and actions in more detail. It is desirable that these groups consist of representatives from the concerned interest groups plus representatives of the institutions that were identified as potential partners in the appraisal phases. Likely, the interest group that proposes a certain ‘solution’ (e.g., strengthening family planning services, supporting community-based soil management, creating a rotating fund for young people’s enterprises, etc.) will be appropriately matched with institutions that have mandate and capacity to deal with the subject (e.g., health departments of the central or local governments, agricultural or environmental NGOs, international development agencies, etc.). If needed, members of the support team can participate as facilitators.

Once a working group is formed, it is good if people introduce themselves and state what they would like to achieve from the workshop. A facilitator can then initiate the working session itself by asking the interest group representatives to summarize briefly what they are suggesting to do and what kind of support they may need from the partners convened. After this beginning, the potential partners’ representatives will comment, ask questions and present alternative options. The facilitator can use open-ended questions to help elicit comments about how the solution and required support fit with the institutional mandates, policies and resource capabilities of the participants in the small group.

Answers and other key points can be recorded (on flipchart, chalkboard, etc.) for the group to use in their discussion. In case the ‘solution’ and relative action are acceptable and feasible for the partners, the terms of reference of the collaboration could be drafted by summarizing or highlighting the main points of the discussion on the flipchart or chalkboard (the participants should confirm whether the facilitator’s phrasing really catches the meaning of what has been said). Planning for action involves deciding which specific activities should be carried out by whom, where, when and with what means. In other words, the following questions should be clearly answered:
A good time to stress the inter-linkages existing among
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Once a common information base is shared among all the participants, different environmental and population issues, as well as the need to coordinate efforts among various government agencies, local interest groups and other actors, can be appropriately matched with institutions that have mandate and capacity to deal with the subject (e.g., health departments of the central or local governments, agricultural or environmental NGOs, international development agencies, etc.). If needed, members of the support team can participate as facilitators.

Once a working group is formed, it is good if people introduce themselves and their expectations. Once a common understanding is established, a facilitator can initiate the working session by asking the interest group representatives to briefly summarize what they are suggesting to do and what kind of support they may need from the partners concerned. After this briefing, the potential partners' representatives will review the proposed solutions and actions in more detail. It is desirable that these discussions are encouraged to summarize briefly where they are successful and what is still needed to achieve the intended goals of the workshop. Answers and other key points can be recorded on flipchart or chalkboard.

Negotiating a suitable course of action

A facilitator can use open-ended questions to help stimulate discussion on the information provided by the interest group representatives on specific solutions or actions. The facilitator can then use these discussions to structure the framework for collaboration. This process involves identifying the common interests and potential areas of conflict or disagreement among the participants. The facilitator can then help the group to identify potential solutions and actions that address these issues.

Answers and other key points can be recorded on flipchart or chalkboard.
Sharing the appraisal and feasibility analysis information

Sharing the information generated by the appraisal and feasibility analysis information

• Have the workshop in an appropriate setting. The workshop venue need not be too elaborate. It is important to select a venue that is accessible and is willing to host the workshop. The facility should be able to accommodate the number of participants expected and should be able to provide all necessary equipment and supplies.

• Pay attention to the communication support. Participants should be encouraged to ask questions and express their opinions. The workshop leader should be able to handle any technical issues that may arise during the workshop.

• Facilitate official acknowledgment of the workshop. Conducting a formal opening and closing of the workshop is important to acknowledge the participants and the importance of the information being shared.

• Take care of details. It is very useful to make a list of all the equipment, supplies, materials, and tools that may be needed and to check that they are available before the workshop.

• Respectively devoted to information sharing and decision-making, which are carried out on two consecutive weeks or the appropriate period.

• Sharing the overall and closeout will include the participation of local civil society and the government. The sharing will be done in a structured manner and will be presented in a format that is easy to understand.

• Pay attention to the communication support. Participants should be encouraged to ask questions and express their opinions. The workshop leader should be able to handle any technical issues that may arise during the workshop.

• Facilitate official acknowledgment of the workshop. Conducting a formal opening and closing of the meeting according to local protocols helps all parties to accept the importance of the information being shared.

• Take care of details. It is very useful to make a list of all the equipment, supplies, materials, and tools that may be needed and to check that they are available before the workshop.

• Respectively devoted to information sharing and decision-making, which are carried out on two consecutive weeks or the appropriate period.
Box 5.1

**Possible Program for a Two-Day Participatory Planning Workshop**

---

**First Day—Morning**

**Opening Ceremony:**
Local authorities and/or religious leaders as appropriate

**Plenary Session:**
Introduction by chair and facilitators as appropriate (members of the PAR support team may play some of these roles)

**Explanation of the Agenda by the Chair and Introduction of the Facilitators/Resource Persons as Appropriate:**

**Exposition of the Results of the Participatory Appraisal and Analysis (Problems, Opportunities) and of the Remedial Actions Prioritized by the Community:**

**Presession and Discussion of the Results of the Participatory Appraisal and Analysis (Problems, Opportunities) and of the Remedial Actions Prioritized by the Community:**

**Plenary Session:**

**Local authorities and/or religious leaders as appropriate**

**Opening Ceremony:**

---

**First Day—Afternoon**

**Work in Small Groups:**

Instruction of proposed solutions and actions (discussion of action matrices, Tables 5.1-5.6-6) and discussions of action matrices by all small group participants

Formation and organization of work space for the small groups, each dedicated to one specific.

**Second Day—Afternoon**

**Work in Small Groups:**

Discussion of action in detail, in particular reapplying feasibility, potential conflicts, timelines, etc.

**Second Day—Morning**

**Work in Small Groups:**

Presentation of the results of the work in small groups by the group spokespersons, and discussion by all participants

Process comments by members of the PAR support team

Summary of results by the PAR support team

Plenary Session:

**Closing Ceremony:**

---

Note: It's best to break the workshop program into two sessions, maximizing attendance by various representative in some situations. An acknowledged rest day during the week can be appropriate if less than half a day more than three days of the weekend or any local holiday.
- **What** is to be achieved?
- **What** specific skills are needed?
- **Who** will be responsible?
- **Who** will actually do what?
- **Where** will activities take place?
- **When** will the activities occur (e.g., in relation to seasons and other pre-set activities of the community), and for **what duration** will they be happening?
- **What material inputs** will be needed (e.g., seeds, tools, family planning supplies, etc.) and how will they be provided or gathered?
- **How much money** is required, and from **what source(s)** is it to be provided?

In planning for specific activities in the community, it will be important to establish the 'ownership' of the project. In this context, ownership relates to responsibility and control, especially for taking on-going decisions and distributing benefits. If this issue is not specifically clarified, participants may simply assume that the 'ownership' is commonly understood only to run into conflict when multiple perceptions become apparent (e.g., at the time of distributing benefits). Clear statements in the planning phases will help avoid subsequent disputes.

In order to implement one or more portions of the plan, the interest groups and/or pre-existing institutions in the community may wish to become more formalized, with rules of membership and procedures. Such groups will be stronger and more sustainable if they formulate a simple set of by-laws. Facilitators can guide this process by asking some basic questions like the ones in Box 5.2. Since many of these questions need to be answered by all the members of the relevant groups, further meetings may need to be scheduled to clarify all the points. These new or strengthened pre-existing institutions may be a most important and lasting benefit of the PAR process.

A good plan will include a monitoring component, i.e., a set of statements indicating how and by whom the implementation process will be checked to ensure that activities are taking place as planned and that the desired results are occurring (see Chapter 6 for more on monitoring and evaluation). Members of the monitoring task group can assess inputs and
Box 5.2

**Guiding questions for assisting local group formation ('institution building')**

- How is the membership of this group determined?
- Who are the current members and how can new members join?
- How will decisions be made?
- Who will need to be present?
- Who will speak for the group in public?
- How is money to be handled?
- Who is responsible for accounting and where is the money kept?
- How will any surplus funds be distributed?
- How often does the group membership need to meet?

Adapted from: Bergdall, 1993

Outputs (e.g., quality, quantity, timeliness) and, if needed, check on accountability (e.g., profits and losses). Monitoring is an especially important function to uncover problems as early as possible (e.g., constraints or unanticipated negative impacts), and thereafter to bring those problems out into the open for group discussion and re-planning. In these ways, monitoring will help sustain community trust and legitimacy for the planned activities.

To facilitate planning, a participatory planning matrix similar to the one presented in Tables 5.4 a–c (pp. 175-177) could be drawn on a flipchart and progressively filled out by the facilitator on the basis of group suggestions. The facilitator should make clear that the purpose of the exercise is to define and agree on a framework for joint action whose validity is to be continuously checked. Conditions or terms of reference in the framework might, for example, say how the participants will:

- establish a management committee in which all actors (persons, groups and institutions) with a stake in the implementation are represented;
- monitor activities and results, i.e., what strategies and types of information will be used to keep track of what is happening and whether the desired outcomes are occurring.

During this process of refining plans, it is useful to ask once again about gender issues (see Box 5.3).

If the suggestions brought up by the interest group are not acceptable and/or feasible for all the partners, or if a conflict of interests becomes
Box 5.3

A reality check for common initiatives: gender roles

Consider the initiative just planned, including the primary activities, their ongoing management and monitoring and the distribution of benefits.

- Which of the planned activities are traditionally done by women? Which are traditionally done by men? Who has the best knowledge and skills to carry them out?
- Will any gender group be disadvantaged by the planned activities? How, specifically? What can be done to remedy or mitigate the disadvantage?
- Will traditional gender roles cause any problems in successfully completing the tasks? If yes, how might these problems be overcome?
- Will there be any gender-differential in the distribution of benefits? What, specifically? What can be done to remedy that?

...apparent, further efforts will be needed to explore the nature of the difficulties until the parties have reached an agreement.

Managing conflicts

The success of a participatory planning workshop depends on the willingness of participants to share information and make common decisions. Involving local actors in such a process is a sensitive task, in which the PAR support team can provide good human, diplomatic and organizational support. There are many potential sources of conflict, including contrasting economic and status interests, ethnic and cultural differences, previous misunderstandings between the community and government or NGO representatives, bad records in personal relationships, family grudges and individual rivalries. Any of these can act against the efforts of the interest groups to establish agreements.

When there are strongly conflicting interests, it is generally wiser to acknowledge the difficulty of solving most of these conflicts and concentrate on suitable means of managing them. Experts in conflict management have identified three basic strategies for addressing a conflict: negotiation, mediation and conciliation (see Figure 5.4) The support team can assist in the use of such strategies if and when needed in the planning workshop. In all likelihood, conflicts that are serious and complex enough would surface and be dealt with before the workshop. If they come out during the workshop, the postponement of decisions may be needed.

Negotiation is a voluntary process in which parties meet face-to-face to reach a mutually acceptable resolution of a conflict issue. Mediation is the assistance of a neutral third party to bring about a negotiation process. Conciliation is an attempt by a neutral third party – such as the
Figure 5.4
Methods in conflict management

**Negotiation**

the parties meet face to face to reach a mutually acceptable resolution of the dispute

**Mediation**

the support team provides assistance for the negotiation process, but has no power to render a decision

**Conciliation**

the support team communicates separately with disputing parties to reduce tensions and facilitate their reaching agreement

Adapted from Pendzich at al., 1994

support team – to communicate separately with disputing parties for the purpose of reducing tension and agreeing on a process for resolving their disagreements. While in a formal judiciary system a conciliation has the power to decide the controversy, the PAR support team has usually only the mandate to assist and facilitate.

Getting conflicting parties to achieve a compromise agreement entails a strongly pragmatic attitude and behavior on the part of all the support team, including minimizing the bias of their own personal and political views. This is not to say that a support team can ever be totally neutral, but to stress that, in a facilitation role, its members should try to behave as much as possible as if they were neutral with respect to local interests and points of view.
Several difficulties can arise in the small group work. The time allocated for the workshop might not be sufficient to explore in detail all the implications of the conflicts which become apparent. Institutional representatives may have insufficient decision-making power without returning to their organizations to consult at a higher level. Resources required to implement the solution might not be available through any of the participating groups or partner institutions. Sometimes, for a variety of overt or hidden reasons, one of the parties is not interested in actually reaching an agreement. In these cases, it might be appropriate to agree at least to explore the issue in more detail. This may include a schedule for further meetings and reciprocal visits at which the PAR support team may again facilitate the process (after due preparatory work).

Stating commitments and concluding the workshop

At the end of the specific planning session, the results of the working groups should be presented in plenary by spokespersons identified by the groups. Planning matrices such as the ones in Tables 5.4 a–c can be displayed on the walls of the plenary room and the spokespersons can illustrate them. The purpose of these short presentations is to make every workshop participant aware of the problem-solving, negotiating, and eventual agreements achieved within the groups. Stating the reciprocal commitments in front of a wider audience will powerfully strengthen the reached agreements.

The PAR support team members may comment and stress the importance of inter-linkages among the different types and levels of ‘solutions’ and activities. For instance, it can be mentioned that soil protection will benefit local productivity, and therefore income and nutrition, which will improve local health and well-being and encourage the youths to stay. New businesses will enhance the chances for local livelihood and encourage people towards sound environmental management. The health and family planning services will mean that women will be much better off and have time to invest in sound environmental management, including soil preservation measures. And so on. This will help convey the idea – especially to the external workshop participants – that a comprehensive and integrated effort is needed to deal with the local environment and population dynamics. A comment might also be made about the need for on-going monitoring and evaluation, and the value of another participatory assessment exercise after a suitable period of time to assess the progress towards implementation.
It is important that the process itself be evaluated by the participants. The workshop participants should share their assessments of the procedures used and the results of the exercise (be aware that a 'courtesy bias' may prevent participants from sharing negative assessments and thus encourage them to do so, if appropriate).

Copies of the final plans of action can be circulated among the interested people in the community and outside. In addition, summaries of the agreements can be posted at one or more suitable community locations as large semi-permanent displays, which may include graphics or pictograms to aid non-literate members of the community.

An official closing ceremony and a customary social event can be very appropriate to acknowledge the work of the interest groups and other participants in the planning workshop.
Table 5.4 a  
Example of filled participatory planning matrices; interest group of mothers of young children (‘Amada’, 1997)

<table>
<thead>
<tr>
<th>What do we want to accomplish?</th>
<th>What should we do?</th>
<th>By when?</th>
<th>What do we need for doing it?</th>
<th>From where do we get it?</th>
<th>Who will do it?</th>
<th>How will accomplishment be assessed?</th>
</tr>
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<tbody>
<tr>
<td>To have in the community a health post run by a local woman, capable of helping us to improve family health and have the number of children we desire.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare a list of possible candidates fitting requirements (including family permission)</td>
<td>June 1997</td>
<td>Discuss the matter in the community, hear the opinion of the traditional birth attendants</td>
<td>Chiefs, women leaders, health workers</td>
<td>Members of the interest group</td>
<td>List prepared</td>
<td></td>
</tr>
<tr>
<td>Official selection of candidate</td>
<td>July 1997</td>
<td>Large consensus in the community</td>
<td></td>
<td>Members of the interest group, community council, community assembly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registration to the course</td>
<td>August 1997</td>
<td>Ticket and per diem to get to the District Headquarters</td>
<td>Contribution of community members raised during meeting</td>
<td>One member of the interest group and the appointed candidate</td>
<td>Candidate accepted and registered</td>
<td></td>
</tr>
<tr>
<td>Participation in the training course to be held in the District Headquarters</td>
<td>Sept.-Dec. 1997</td>
<td>Scholarship</td>
<td>Ministry of Health</td>
<td>Appointed candidate (assisted by the person responsible for health on PAR support team)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building of health post according to District Health Team specifications</td>
<td>Sept.-Dec. 1997</td>
<td>Local materials, labor, cement, tin, nails, glass, corrugated iron</td>
<td>Community council Donor via local NGO</td>
<td>Community men, women, youths coordinated by the community council and head of local NGO</td>
<td>Health post built according to specifications</td>
<td></td>
</tr>
<tr>
<td>Equipping the health post</td>
<td>Jan. 1998</td>
<td>Standard health post equipment</td>
<td>Ministry of Health</td>
<td>Responsible staff at District Health Center</td>
<td>Health post equipped according to specifications</td>
<td></td>
</tr>
<tr>
<td>Start-up of the part-time contract for local health-care person</td>
<td>Feb 1998</td>
<td>Some basic capital for the year</td>
<td>Collection from the community, support from local NGO</td>
<td>Community Council and head of NGO</td>
<td>Contract signed, salary delivered on time</td>
<td></td>
</tr>
<tr>
<td>Delivery of supply and post-training follow-up in the community</td>
<td>March 1998</td>
<td>On-going communication with District Health Center</td>
<td></td>
<td>Mother and child care and FP nurse supervisor in the district</td>
<td>Follow-up carried out</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Supply handed in</td>
</tr>
</tbody>
</table>
Table 5.4b
Example of filled participatory planning matrices; interest group of farmers of hillside plots (‘Amada’, 1997)

<table>
<thead>
<tr>
<th>What should we do?</th>
<th>By when?</th>
<th>What do we need for doing it?</th>
<th>From where do we get it?</th>
<th>Who will do it?</th>
<th>How will accomplishment be assessed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify the plots in need of erosion control works</td>
<td>May 1997</td>
<td>Interest group meets with all hillside farmers</td>
<td>Forestry and Agriculture Dept. at district level</td>
<td>Interest group members each speaking with other farmers</td>
<td>List of farms in need</td>
</tr>
<tr>
<td>Support plot owners on different erosion control measures (inter-cropping, ridges, etc.). Develop demonstration plots</td>
<td>June–Sept. 1997</td>
<td>Competent technicians</td>
<td>Development NGO</td>
<td>Interest group member and representative of village council will request the support</td>
<td>Technician visited all the interested farmers Demonstration plots in place</td>
</tr>
<tr>
<td>Implement different erosion control strategies</td>
<td>Oct. 1997–April 1998</td>
<td>Equipment and materials for ridges; seeds for inter-cropping</td>
<td>As above</td>
<td>Each farmer with the support of interest group and technicians</td>
<td>Extent of ridges and intercropping for erosion control applied, diminished erosion, increased productivity</td>
</tr>
<tr>
<td>Monitor and follow-up the erosion control works</td>
<td>May 1998</td>
<td>Transport and per diem for technicians</td>
<td>Forestry and Agriculture Departments Development NGO</td>
<td>Technicians and interest group members with all the relevant farmers</td>
<td>Monitoring meetings and further decisions assessed and carried out</td>
</tr>
</tbody>
</table>
What do we want to accomplish? To set up a local business for harvesting, processing and marketing non-timber forest products (bamboo, leaves, bark, vines, berries, mushrooms, etc.).

<table>
<thead>
<tr>
<th>What should we do?</th>
<th>By when?</th>
<th>What do we need for doing it?</th>
<th>From where do we get it?</th>
<th>Who will do it?</th>
<th>How will accomplishment be assessed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtain advice and support from Forestry Department and environment and development NGOs</td>
<td>July 1997</td>
<td>On-going contacts, building up of a trust relationship</td>
<td>Collection among group members to pay for transportation, as needed</td>
<td>Group coordinator and members</td>
<td>Contact made, agreements established for training and matching fund</td>
</tr>
<tr>
<td>Discuss past forest management regimes and use of NFTP with village elders</td>
<td>July 1997</td>
<td>Assemble village elders in one place, offer tea and food</td>
<td>Collect tea and food from members’ home</td>
<td>The group members, village elders</td>
<td>Meeting with village elders held, information on past practices shared, decision on follow-up to re-establish a management system</td>
</tr>
<tr>
<td>Training workshop with forestry department and NGOs</td>
<td>Sept. 1997</td>
<td>Pens, paper, food and accommodation for visitors</td>
<td>Take up a collection, local households to provide lunches and beds</td>
<td>Interest group, Forestry Department, NGOs</td>
<td>Workshop held, young men learn more about processing and marketing of NTFPs</td>
</tr>
<tr>
<td>Establish regular monitoring of the forest</td>
<td>Sept. 1997 ??</td>
<td>Persons appointed as forest guards; agreement on fines to be collected by guards</td>
<td>matchingfundandtechnicalsupportfromNGO(withfundingfromexternaldonor)andForestryDept.</td>
<td>Young community members chosen by the elderly</td>
<td>Reduction in illicit cutting and harvesting of forest products</td>
</tr>
<tr>
<td>Pilot project to harvest, process and market NTFPs</td>
<td>Nov. 1997 ??</td>
<td>In-depth feasibility and profitability studies. Tools for harvesting and processing Technical support</td>
<td>Matching fund and technical support from NGO (with funding from external donor) and Forestry Dept.</td>
<td>Organized members of interest group</td>
<td>Income from sale of NTFPs vs. investment and labor expended</td>
</tr>
</tbody>
</table>
6. PAR on population dynamics and the local environment: learning by doing
A peculiarity of participatory action research is that the phases of information gathering, appraisal, analysis and planning continue into the implementation phase. The researchers, planners, implementers and beneficiaries are one and the same, working for themselves to improve their livelihoods, their health and their environment. This chapter will describe a process of ‘learning by doing’ that is an integral part of project implementation, and not a separate evaluation that comes only after the project is completed. The example of Pallisa, first introduced in Chapter 1, is used again to illustrate how plans and activities are refined as they are implemented.

6.1 Getting started
Organizing for action
Role of the PAR support team

6.2 Learning by doing
Participatory evaluation
Communicating findings and follow-up
External evaluation of the PAR process

6.3 Primary environmental care: moving forward in Pallisa!
Community organizing
Meeting people’s needs whilst caring for the local environment
A few practical matters
6.1 Getting started

Having successfully completed the planning phase of participatory action research, the community can embark upon the difficult but rewarding task of implementation. At this stage, interest group members, external partners and other members of the community, as appropriate, carry out the action plans developed during the planning workshop.

Though implementation may appear to be the long sought-after (and at times elusive) goal which justifies the research and planning phases of PAR, it is important to maintain a balanced perspective on the relative value of each PAR component. In fact, the two early steps of PAR are as important as the actual implementation, for they help to build the understanding, commitment and sense of ‘ownership’ necessary to carry out the initiatives. By the same token, unless there is an action component in PAR, the whole process falls short of its potential, and people are likely to become disheartened. Therefore, it is important that the momentum built up during the research and planning phases is soon channeled into concrete initiatives to solve specific problems.

A few key factors should be considered:

- implementation demands good coordination and an explicit attribution of responsibilities;
- time lines are important for keeping initiatives on track;
- financial and material resources need to be procured sufficiently in advance of project activities, so that they do not constitute bottlenecks to implementation.

The last two points are addressed in the participatory planning matrices presented in Chapter 5 (Tables 5.4a–c). In the following sections the roles of the interest group coordinators and the PAR support team are addressed.

Organizing for action

It is important to the success of the initiative that one or a few people assume responsibility for coordinating activities (see Box 6.1). The coordinator role could be an elected position, or a position that rotates among members of a group. The coordinator ensures that the priority actions decided at the planning workshop do get implemented and that meetings of the relevant partners are held on a regular basis. Such meetings facilitate communication among the various actors and are
Box 6.1

Managing for an 'enabling' environment

Under traditional, bureaucratic forms of organization, managers hold decision-making and planning authority. Problem-solving is the domain of top managers, and problems are passed up the ladder for solutions. Power is concentrated at the top, and those at lower levels fear making decisions or taking initiative because they may be reprimanded for stepping out of line or making mistakes.

In an enabling environment, the manager becomes a coordinator. Coordination involves facilitating relationships between people and events. A good coordinator helps to place people in such a way that they can develop good relationships with each other and carry out work effectively.

A coordinator helps to support, build and challenge the actions of groups, and does not foster competition or dependency. A coordinator helps to build teams and groups so that they themselves become self-directing, self-starting and self-managing. Creativity and taking initiative on the local levels are encouraged.

Communication is based on dialogue. Those most affected and directly related to a task take responsibility for that work. Orders are never given. Work is seen as a mutual task to be done and a mutual learning process. The important principle is to have clear, transparent and open forms of communication which everyone in the organization knows about.

Problem-solving and decision-making are done by the appropriate work group or the community. Local work groups have guidelines and policies to help them, but the more responsibility taken by the smallest unit, the more productive and the more self-managing the community can become.

The way the group works is decided by that group itself. They decide their own procedures based on the goals and direction of the initiative, their particular area of work and their strengths and weaknesses.

Adapted from: Hope and Timmel, 1984

crucial for monitoring process and outputs. In addition to the overall coordinator of activities, the interest groups may wish to elect other 'responsible persons'. These individuals can follow up activities more specifically related to one issue or problem, or to broad subjects of importance to the interest group. A specific individual may also be selected to monitor all the planned activities and report on those to the village council or other relevant body.

The implementation phase may also benefit from an advisory council. Ideally, the council would be composed of respected individuals with an interest in community well-being, but without a direct vested interest in the outcome of the specific actions. Male and female elders, school teachers and even professionals residing outside the community may be appropriate. The benefit of 'institutionalizing' the PAR in this way is that it broadens participation by community members (and non-members)
Case Example 6.1

Women and natural resource conservation in Pakistan

Conservation of water is a critical issue in the Kanak Valley of Balochistan Province in Pakistan. The FAO Upland Conservation and Development Project has, since its inception phase in 1992, promoted involving women as part of the overall strategy for participatory watershed management. Empowerment entails a lengthy process stressing women’s increased participation in economic, social, political and environmental decision-making as active community members. The project used the slide language technique among newly formed women’s associations at the village level in Kanak Valley. It is through this technique that women have come to ‘own’ the issue of diminishing water resources and to take action. A woman from each association was assigned a camera, and was asked to take random photographs of environmental issues. The women, as it happened, preferred to take photographs to accompany a story line with a definite message. Once all the associations had taken a series of photographs, a convention was held to select the best set.

The winning slide show was narrated with the following story: “Thirty years ago our area was very beautiful and prosperous. Most of the population depended on agriculture and livestock rearing. The surrounding fields and mountains were green and sweet-smelling. People could gather fuel wood and fodder for animals from one area for many months, and there were never shortages. People used kareze water (underground water courses) for irrigation purposes. Everyone had access to the water. With the arrival of the ‘development era’, electricity was installed in Noza sub-watershed. People gradually became aware that landowners were not satisfied with the income they were receiving from crops and orchards irrigated by kareze water. They decided that if they installed tubewells they could increase their income dramatically. So landlords started digging and putting in tubewells. When the tubewells were ready, landlords began increasing the number of orchards. More and more land was cultivated and turned into orchards and vineyards. Landlords started making lots and lots of money and became very wealthy. The groundwater level started dropping and the karezes dried up. Vegetation cover started drying and disappearing. People are having problems finding fuel and fodder for animals. Life is becoming more and more harsh and difficult. Sometime women spend six hours a day going in search of drinking water. The green fields have turned into desert. Beautiful villages have disappeared because we had to move as the water sources dried up or became saline. Our future is nothing but ruins, unless we act together to try to solve this problem.”

From this description of the problem of lowering water tables, and the accompanying slides, the women’s association developed the following proposed solutions:

- The FAO project should assist villagers in the area to organize a meeting of landlords, absentee tubewell owners, and owners of the upland. These people need to discuss this serious problem and propose actions that they can implement themselves to use water in a better way. These people own the resources and have the power to do something.
- People should work with the project to construct check dams whenever possible and they should plant trees around these dams.
- Owners of wells are wasting large amounts of water. The project should have a policy enforced that would require owners of tubewells to invest in trickle irrigation.

Adapted from: Kane, 1996
and draws on a wider body of expertise. It may also help to ensure that the PAR process is carried forward, and that there is accountability on the part of coordinators and others involved.

**Role of the PAR support team**

In keeping with the primary environmental care approach, PAR is aimed at empowering communities to address problems that they have identified and defined. By supporting the community in a systematic review of their problems, opportunities and constraints, by working with them to develop a plan of action and by supporting them to gather the resources and agreements necessary to implement it, an effective support team helps them to gain new confidence, new avenues and new alliances for their own welfare.

Usually, the participatory appraisal and planning phases are the time of maximum involvement of the support team. Yet, the members of the team can still play an advisory role during the implementation phase, and may be called upon for consultation when problems arise. Some team members, particularly local field workers, will have regular interaction with community members in the course of their work, and can serve as valuable resources during the implementation phase.

In addition, the PAR support team can work with community members to propose changes to government policies that are obstacles to community development, or meet with bankers in the capital to extend small credit schemes in rural areas. It can also be called on by the community to facilitate monitoring and evaluation activities. This can help to reinforce the tools and procedures the community has got acquainted with in the original participatory appraisal and planning phases.

Care must be taken to critically evaluate assistance to the community. For instance, team members need to avoid playing too big a role mediating between the community and outside agencies or authorities. Team members may wish to introduce community members to potential sources of technical or financial support, but the actual negotiating and coordinating with those external agencies is best left to the community itself. Too much help by a facilitator tends to undermine independence and self-confidence in the same way that premature introduction of capital inputs does: it can foster dependency rather than self-reliance and sustainable development.
Case Example 6.2

Field notebook: primary environmental care in Burkina Faso

In 1995, Burkina Faso’s Ministry of Environment and Water established a PEC project in Namentenga, a semi-arid and drought-prone province with high mortality rates and poor infrastructure. Two test villages were chosen for the pilot project on the basis of criteria such as severity of water and energy problems, community dynamism, number of outside interventions and incidence of Guinea worm disease (dracunculiasis). (The latter requirement was to establish links with UNICEF’s eradication program.) The two villages selected – Pelga and Kologhsom – contend with major agricultural constraints: declining soil fertility, lack of fallow periods, and low-level technical inputs. Pelga, located in the north and more agro-pastoral, is characterized by severe soil erosion. Kologhsom has the highest incidence of Guinea worm disease in the province.

The project invested much time in PAR in each village. The PAR assessment and planning techniques employed included social and environmental maps and walks, agricultural/seasonal calendars, daily activity profiles, and decision-making matrices. Women, men and youths were involved in both joint and separate groups. The materials used varied according to the group’s comfort level; women (almost none of whom are literate) used local materials, whereas men and younger people were more comfortable with markers and paper. Meetings were held in each village to synthesize results, draw out problems, causes, solutions and develop action plans.

Based on the needs identified by the communities – and the project’s budget – the action plans are now being carried out. Kologhsom’s top priority is access to potable water: the number of village wells is insufficient, and they are not evenly distributed. The village women created a water management committee to oversee existing waterholes and repair pumps. Improved health and agricultural production are the village’s next priorities.

In Pelga, access to water is also a priority. Villagers have plans to construct a water point at the village school to irrigate a vegetable garden. The garden will help to meet students’ food needs and diversify their diet. The villagers hope to construct a canteen at the school with revenues from the garden. Another priority is sanitation. The village has plans to construct pit latrines to mitigate water contamination. Other plans include the purchase of a mill to lighten women’s workloads, and a credit scheme to help meet household expenses. There is also an afforestation component in both villages to ‘nourish’ the environment upon which they depend.

The benefits of the appraisal process can be seen in the community mobilization and motivation it prompted; inhabitants of both villages established committees to support the implementation of their own action plans (with women well represented). Because some of the partners had little experience with a gender-sensitive approach, as an integral element of PAR, a one-day workshop was organized to acquaint them with gender issues in conservation and development.

Currently, monitoring and on-going evaluation of the activities are crucial, as the initiative is piloting PEC experiences in Burkina Faso in view of a replication/expansion phase.

Contributed by Lisa Garbus
6.2 Learning by doing

In PAR, evaluation is not a one-time activity at the end of a project. Rather, monitoring and evaluation are on-going throughout the PAR process (see Figure 5.3, p. 162). Through a reflective approach, interest groups learn from successes as well as mistakes along the way, building their knowledge base and their capacity to respond to external change.

The two words – monitoring and evaluation – are used so frequently together that they may appear to be different ways of saying the same thing. However, it is important to distinguish between the two. Monitoring involves checking to see if specific project tasks are being accomplished in a timely and appropriate (i.e., transparent, honest, participatory) manner, and identifying external conditions that affect project performance. Evaluation, on the other hand, refers to a periodic look at project organization, approach and outputs. Evaluation can help to determine if the project is properly designed to achieve longer-term objectives. Put in another way, monitoring regularly checks if the project is ‘on track’, and evaluation questions whether the project is ‘on the right track’.

Monitoring is integral to any activity, and most of us regularly monitor our progress towards achieving various personal and professional goals, even when we do not consciously call it by this name. Because of its iterative nature, most interest group members will probably be involved to a greater or lesser extent in PAR monitoring. Still, it will most likely be the responsibility of coordinators to ensure that regular monitoring of the planned activities takes place, and that up-to-date records are kept of finances and progress. Together with all the partners working together on a specific activity, decisions can be made about how to redress deficiencies in implementation. Evaluation takes place less frequently, and therefore requires a more formalized mechanism.

Participatory evaluation

In traditional project management, evaluation is frequently left to outside consultants who assess the results of a project, often with the intention of determining whether or not a given activity will receive continued funding. The reliance on external evaluators to obtain an ‘objective’ view of the project too often results in alienation and fear on the part of project implementers and beneficiaries, especially if the project’s continuation is tied to a favorable review. It can also serve to perpetuate a ‘conspiracy of success’ in which project achievements are emphasized while mistakes and problems are downplayed or ignored.
Box 6.2

Why participatory evaluations?

Involving the community in developing an evaluation process ensures that all aspects of concern to the community are covered. It also enables the skills and knowledge available within the community to be identified and utilized for information collection and analysis. This reduces reliance on outsiders (e.g., consultants), who may be much more expensive and less informed, to do this work.

The results of the evaluation exercise should enable decisions to be reached on whether to change the objectives of the initiative, change the strategy, change activities or continue all or some. In a participatory evaluation both specific activities and the objectives of the initiative are considered, with the objective of learning what worked (and why) and what was not successful (and the reasons for that). The process is intended to be forward looking and developmental in nature, and not regulatory, judgmental, and controlling.

In PAR, evaluation is carried out with the participation of all stakeholders in the project, and especially the community members. The goal is to involve as many parties as possible in a frank and honest assessment of what has been achieved, but also where and how the initiative needs to be improved. The results of evaluation are then implemented as quickly as possible (Gajanayake and Gajanayake, 1993). This ‘learning by doing’ is characterized by a willingness to learn from mistakes and a recognition that projects evolve in response to changing circumstances and needs.

The evaluation of initiatives provides an opportunity for both outsiders and insiders to reflect on the past in order to make decisions about the future. In a participatory process to design an evaluation, community members are encouraged and supported by the PAR support team, local institutions and external agencies to take responsibility for and control of:

- planning what is to be evaluated;
- deciding how the evaluation will be done.

Much of the material acquired from the participatory information gathering, assessment and planning exercises can be used in participatory evaluation.

In a preliminary evaluation meeting of a half day’s duration, the interest group and/or the community at large might go through the following steps to develop a plan for the evaluation:

**Define the purpose.** Review the goals and objectives of the initiative as defined during the planning phase, and the reasons for the evaluation...
Indirect indicators provide information on aspects which cannot be easily or accurately measured (i.e., what do we want to know?). A useful exercise may be to write a one-sentence statement of purpose that seeks to answer the following questions:

- Who has a stake in the outcome of this evaluation?
- What would they like to come out of this?
- How will the results be used?

Define the priority areas. These can be written as questions on large sheets of paper or a blackboard, and then rank-ordered. In addition to results-oriented questions (Did we achieve our stated objectives? Were the benefits achieved at a reasonable cost?), several process-oriented questions might be included, such as:

- Was the process participatory?
- Was decision-making open and transparent?
- How did we handle contingencies (setbacks, constraints)?
- Was the budget well managed?

Identify responsible people. Decide who will do the evaluation (e.g., the whole community in an open meeting, the interest group, or the interest group with the PAR support team), and which people will gather what information. If the community lacks the skills to conduct a thorough evaluation, an outside facilitator may be hired, with terms of reference that include capacity-building of local ‘evaluators’.

Identify indicators. These can be direct and indirect. Direct indicators are pieces of information that directly relate to what is being measured (e.g., the number of cattle owned by a family). Indirect indicators provide information on aspects which cannot be easily or accurately measured (e.g., whether a family possesses a radio or a bicycle can, in some communities, be an appropriate indirect indicator of its ‘total wealth’). Examples of indicators in the population, health, and environment sectors can be found in Chapter 2.

Identify the information sources for evaluation questions. If the information is not currently available, decide what ways of gathering information and what tools would be appropriate. If one tool has been used before, it may be used again to update the information and show the change that has occurred.
Once an evaluation plan has been agreed upon, the interest groups and partners (if any) can develop a timeline for carrying it out. Timing needs to take into account factors such as seasonal constraints, labor demand, religious holidays and field staff availability.

The tools for evaluation will depend largely on the activity being evaluated, and on whether quantitative or qualitative data are sought. Quantitative approaches measure changes in numerical indicators (e.g., number of people served by the village health assistant, area of hillside fields where erosion signs are still evident, or income from the sale of non-forest timber products). Qualitative approaches, such as focus groups and open-ended interviews, identify and describe people’s subjective perception about performance and results (e.g., people’s perceptions of how the initiative has affected health, agriculture or income). Many of the tools that are covered in Chapter 4 and in Annex B can be adapted for evaluation purposes, and further tools can be found among the documents in the bibliography.

**Communicating findings and follow-up**

When the evaluation is completed, it is important to schedule a meeting to discuss results and decide on follow-up. The meeting should again gather all relevant stakeholders, including the interest group, the PAR support team, community members, external partners and donors (if appropriate). The results of the evaluation can be presented in much the same way the appraisal results were presented in a community feedback meeting.

In order to incorporate the evaluation results quickly into the implementation process, a follow-up plan can be linked directly to the participatory planning matrices described in Chapter 5 (Tables 5.4 a–c). A follow-up plan should include:

- an agreement on specific activities that must be taken by the interest groups and their partners to meet the evaluation’s recommendations;
- the dates by which the activities should be completed;
- a list of materials/resources required, and their sources;
- a designation of responsibilities for each activity; and
- a description of the assessment/monitoring procedure.
By holding this meeting and modifying/adding to the original planning matrix, the evaluation’s results are systematized into the normal implementation procedures (Aaker and Shumaker, 1994).

**External evaluation of the PAR process**

On a final note, even if the implementation phase encounters setbacks, or is not particularly successful in terms of quantitative indicators, there may still be benefits of the PAR that should be recognized. For instance, the PAR may have succeeded in raising questions that had never been discussed within the community and, in the process, generated awareness of potential opportunities.

The answers to some of the following questions may not be of direct interest to the community members, but may be of interest to the PAR support team (or donors, if outside funding was used):

- Did the PAR raise awareness among community members about local population dynamics, environmental issues and their linkages?
- Did it enhance communication on the subjects within the community?
- Has there been some form of organizing for action?

This kind of awareness, communication, and community empowerment can leave lasting and tangible benefits for the community, long after the implementation of the ‘priority actions’ has officially ended.
6.3 Primary environmental care: moving forward in Pallisa!

By the time Tom Barton drove into Kapuwai, on a hot, cloudless day in early March 1997, the sun was beginning to sink over the rocky crags to the west, casting a vermillion glaze over a landscape that Tom now appreciated almost as much as those who lived here. Blue-green lizards with orange stripes soaked up the dying rays of the sun on a wall beside a field of maize stalks; a flock of cattle egrets, ethereal white against the indigo blue of the sky, flapped slowly over a cluster of thatch-roof huts. An old man waved at the occupants of the passing vehicle and a gang of bare-chested children shouted excitedly, holding up for inspection little calabashes half full of silver fish. They were on their way home from the lake at the end of the road.

In the passenger seat of the four-wheel-drive vehicle, and just as covered with dust as Tom by this dry-season visit, was Dr. Gimono Wamai. She, too, had become a close friend of the Pallisa Community Development Trust (PACODET) and she loved her visits to the area. She was particularly fond of the women, and they of her, and she had done much to help the community with its health work. In fact, she had been adopted by the community and given a local name, Aikuraun, meaning 'gotten with difficulty'. Had it not been for her age — she was in her early thirties — she might also have been made an elder of the community, as Tom had been in 1995. The villagers had given him the name Amoraican, which means 'we share problems'. As they juddered down the narrow road towards Stanley Okurut's house, Tom/Amoraican reflected that although there were still many problems to solve, community efforts had greatly improved the lives of those who lived in Pallisa district.

Stanley, Anne and the rest of the family were waiting for the visitors and they greeted them warmly outside their small house. While the guests washed away the grime of the day's journey, Stanley lit a paraffin lamp and drew up some chairs beneath a tree in the garden. The sound of late-afternoon birdsong had been replaced by the mechanical whirring of crickets and the croaking of frogs, and Stanley lit a mosquito coil in what he knew would be a vain attempt to keep the biting insects at bay. When the guests returned Anne brought them hot, sweet tea, which they gratefully accepted.

Community organizing
“So how have things been?” asked Tom as he sank into a chair. “Fine, fine,” replied Stanley, with a broad smile. Although a great talker,
Stanley was not much given to idle chit-chat and he immediately began to tell Tom and Gimono about PACODET's structure and progress. "We've now got three main decision-making bodies," he said. "You probably remember, but I'll tell you briefly again, so it'll make more sense of the conversations we will have over the next few days. First, there's a general assembly, and that consists of all the dues-paying members and voluntary members of PACODET, along with all the community groups. Second, we've got the senior advisory board, which is made up of local elders, and then, third, there's the executive committee." The latter, he explained, included 23 representatives—a man and a woman from each of the participating community groups. The committee was responsible for planning future projects, which were then reviewed by the general assembly and the advisory board—which included among its members Tom and Gimono.

The mosquitoes eventually became too much to bear, and Stanley suggested they go inside for supper. As always Anne treated the guests regally and in their honor a chicken had been killed. Boiled in its own juices, it was accompanied by a heavy brown millet and cassava porridge \( (atapa, \) the 'real food' of the region) and various vegetables from the household gardens. Over the meal, Anne and Stanley told the visitors what news there was to tell. Amos Odong was now sharing the post of manager of the executive committee with Anne; V.V. was doing a fine job training community agriculture assistants; a head of family had died of AIDS and left school-age orphans, and a young man had been sent by PACODET for technical training in Kampala. A few years ago the gossip would have been mostly about people; now it was also about community projects. This was a measure of PACODET's influence, which now affected the lives of so many people in the area.

Tom and Gimono left soon after the meal was over, eager for rest at the guest house after the long drive, and knowing that Stanley would be ready to take them on a tour of the community as soon as the sun rose the following day.

Sure enough, Stanley and Anne arrived soon after dawn, as Tom and Gimono were finishing breakfast. Although the day had barely begun, the surrounding countryside teemed with activity. In the field beside the compound, a boy guided a plough behind a pair of oxen, and the dirt track which led towards the town of Pallisa, which lay fifteen miles...
away, was as busy as it ever was: men in crisp white shirts made their way on bicycle towards their office jobs; colorfully uniformed children headed towards the primary school; and strong young women with baskets and pots balanced on their heads or hoes over their shoulders set about their early-morning chores.

Stanley suggested that they inspect the health dispensary, which was soon to be officially inaugurated by the vice-chancellor of Makerere University, and they made their way there by foot. When PACODET began, its main concern was the lack of decent health-care facilities in Pallisa district. Construction of a health dispensary in Kapuwai had begun in 1991, and it was now fully operational with a skilled team of community members who had been sponsored for nursing and midwifery training by PACODET. Gimono talked to two of the team and they discussed the satellite sub-dispensaries, set up in each of the main participating communities and staffed on a part-time basis by locally-trained community health workers.

"Of course there is still a problem with the satellite buildings," said one of the health workers, a slender young man with long, thin fingers. "You’ve seen yourself. They’re mostly in semi-permanent shelters, or in schools and churches." He said that many of the communities had decided to build small local dispensaries, and they had begun to make bricks and gather the raw materials for their construction. "In my view that’s an excellent thing," he added, "especially when you consider that between all of these groups and us here at the dispensary, we now serve over 60,000 people."

When they left the health dispensary they were joined by V.V. Okurut, who had bicycled over to Kapuwai from his village of Kobuin. There was much to see, he explained, and he suggested that they spend the rest of the day looking at PACODET’s projects on the land and talking to farmers (which include men, women and youth in this area).

By 1993 PACODET had already begun to make a significant contribution to the health care of the community, but its members were novices when it came to tackling environmental problems. The will was there, as we saw when Stanley and his colleagues met beneath the mango tree in Kapuwai, but was the expertise?
Meeting people's needs while caring for the local environment

By midway through 1993, members of PACODET had begun to draw up plans for the future. They considered a variety of agricultural and craft-related income-generating schemes; these, they hoped, might raise standards of living and help reduce pressure on the woodlands and wetlands. V.V., an agricultural extension officer by training, worked with others in the group to develop sensitization sessions for community leaders and farmers about pesticide safety and ways to reduce the amount of pesticides being used. Anne, Beatrice, Filder and other leading women in the group immersed themselves in the family planning issue. Some of the plans which the members mooted during those early meetings came to nothing; but many others had come to fruition.

Most people in Pallisa make a living from the land, and farming had been a focus of PACODET activity. “We recently set up our own department of sustainable agriculture,” explained V.V., “and I’ve just finished training another batch of community agricultural assistants.” There was now one in each of the ten communities covered by PACODET and they were helping V.V. to tackle the pesticide problem. “You’ll recall,” he said to Tom, “that one of the major concerns which came to light when we first started looking at the environment was the way in which pesticides were being misused. They were having a terrible effect on insects and birds. We were also worried about the health hazards they posed.”

When the local government officers were sensitized about the pesticide problem in 1993, they introduced by-laws to regulate pesticide use. Among other things, these made the killing of birds with pesticides a criminal offense. “That certainly helped,” reflected V.V. “Soon after the by-laws came in, several people were arrested and news spread round the region like bush fire. Now we can see that people have changed their ways.” Small boys still hunted birds with catapults, but V.V. reckoned that there were far more birds in the area today than there were before the by-laws were introduced.

PACODET was not opposed to the use of pesticides; rather, it wanted farmers to use them only when necessary, and it now encouraged them to practice what might by loosely termed integrated pest management, or IPM. “If a farmer has a pest problem,” explained V.V., “he can contact me or one of the community agricultural assistants and we’ll pay him a
visit.” They then help the farmer to assess the severity of the pest attack and formulate ways to deal with it. Many farmers were proving receptive to the ideas promoted by PACODET. On their own they had noticed that the prophylactic use of pesticides not only leads to a loss of flora and fauna and a decline in fertility, but to the death of *emukuny*, the black ants which play a vital role in controlling aphids and other pests. “A few years ago,” explained V.V. when they reached the fields around Kobuin, “the farmers here used lots of pesticide. Now they hardly use any because they know how important the ants are.”

Indeed, some farmers were actually encouraging the ants. They had discovered that the ants liked sweet-tasting grasses, and they now scatter these grasses around their fields. Gimono asked V.V. whether the protection of the ants made a difference to crop yields. “A big difference,” he replied simply. “That’s why the farmers are so keen to encourage them now.” He took them through a field of cassava to a clump of saplings. “You see these young trees?” he asked. “They have very hard bark and a soft pith – the *emukuny* love them, and that’s why this farmer has planted them around his field.”

When the PACODET committee went on their field walks with Tom Barton in early 1993 they expressed particular concern about the loss of wetlands. Over the years much of the swampy land had been drained to make way for rice paddies. Economically, this had made sense to the farmers: rice was a good money-earner. But the loss of wetlands had led to a decline in the fish catch. The fish had hitherto been an important source of protein, especially for the poorer families with little land. The catfish also fed on mosquito larvae. Since the decline in their number, malaria-transmitting mosquitoes had become more common.

“We’re tackling the wetland problem in two ways,” explained Stanley when they reached a small area of papyrus and swampy land. “Directly, by ensuring that there is no further drainage. And indirectly, by establishing income-generating projects which provide an alternative to rice cultivation.”

Two of the community projects were farm-based, involving poultry and bees. A small-scale study by PACODET of poultry-keeping had led V.V. to conclude that two factors led to a high death rate of chickens, ducks and other birds. One was disease; the other was predation by wild animals.
To tackle the first, PACODET was encouraging people to have their poultry immunized against certain killer diseases. Many farmers were now doing this. To reduce predation, farmers were advised to confine their birds at night and keep them closer to home at all times, for example, by providing supplementary food near their pens. "Already," said V.V., "farmers are noticing significant gains in their poultry production."

Midway through the afternoon the small party came across a tree slung with beehives. A farmer came out of his hut to join them. "In the old days," explained the farmer, "I used to keep bees in clay pots. But these are far more efficient." He pointed proudly to the wooden hives, locally designed and locally built, which were suspended from the branches of the tree. Tom asked what he did with his honey. Like most people who kept bees in Kapuwai, he used all his honey in the home, although honey could fetch a good price in the local markets. His family poured it on the millet porridge they ate for breakfast, and his wife used it to cure the children's coughs. "Same with us," said Stanley, who was also a keen bee-keeper.

It was late in the day when the party returned to Kapuwai and called in at the agricultural storage building. Stanley explained that most of the people living in the area covered by PACODET still thought of themselves as subsistence farmers, although many were rather more than that: they grew food not only for themselves, but to sell in the marketplace. A perennial problem faced by the farmers related to the fact that most grew the same crops, and harvested them at a similar time. This tended to glut the market, allowing buyers to purchase the farmers' produce at low prices, and also resulted in high prices when foods were scarce, for example, in the dry season or before the new crops were ready to harvest. Naturally, far-sighted farmers who could store food during the times of glut, in order to sell it later at a time of scarcity, would be at a competitive advantage compared to those who did not do so. "And that's what this is all about," concluded Stanley, waving at the storage depot and calling for the store-keeper to come out.

PACODET was now operating as an agricultural cooperative. It purchased food during the harvest period, when prices were low, stored it here, then sold the food in urban markets when the price was high. If the community itself experienced shortages, such as a recurrence of the drastic famine of 1994, then PACODET was able to resell the produce at a price lower than the one prevailing in the market. This system of protect-
ing nutritional security in the community had already been taking place
in the very dry 1996 season – over eight tons of millet had been resold to
the community at a slight profit to the organization but at a major saving
for the community over the commercial rates in the open market.

So, who gained? “Well, PACODET gains for one thing,” explained the
man in charge of the store, “and the farmers do too.” PACODET gained
as the profits made through storage were channeled into its activities –
which, of course, were designed to help the local community. The farmers
gained as they saved the considerable cost of transporting their food
to the urban markets – which was what they used to do – and they could
buy back food well below market price if and when they suffered from
shortages.

So far the system had worked to everyone’s satisfaction, although the
PACODET team were well aware of the problems which had beset agricul-
tural cooperatives in Uganda in the past. “We know that this system
will only work if we are totally transparent and accountable for all our
activities,” admitted Stanley. So far they had been, with all decisions
about prices for buying and selling, as well as the use of funds, being
made collectively by the community committees.

All of these activities – ranging from bee-keeping to agricultural
storage – had helped people in Pallisa to increase their earnings.
Another income-generating project, established under the guidance of
PACODET, had involved carpentry. A workshop now functioned in the
PACODET compound and a manager taught skills and oversaw the pro-
duction of furniture and fittings – which were used in community build-
ings. A tailoring enterprise had also been established, and this was now
involved in the manufacture of school uniforms, with intentions to soon
begin making and marketing mosquito nets for malaria prevention.

The small group was joined at the compound by Amos Odong, who had
just returned from Pallisa. “In theory,” he explained once the greetings
were over, “any activity which raises the standard of living of people in
Pallisa should help take pressure off the wetlands and woodlands in the
area.” He said that since PACODET had begun to take an interest in envi-
nmental issues, wetland drainage had almost ceased. However, uncer-
tainties about how to manage the wetlands remained, and experts who
came to advise had provided little in the way of helpful advice.
As far as the woodlands were concerned, he felt that people's attitudes were changing for the better. Felling of green trees was no longer common practice, and he pointed out that Stanley had conducted experiments on his own land which had gone some way towards dispelling the myth that crops and trees didn’t mix. He had found that certain crops, like potatoes, grew better under big trees like *eyerere* (*a Ficus* species) than they did out in the open. Empirical evidence such as this was encouraging farmers to look after their trees, and in some cases plant saplings.

“But what about the population growth in Pallisa?” inquired Gimono. “The short answer,” replied Anne, “is that the population continues to grow, but there is a far greater awareness now about the cumulative effects that population growth has on the environment, health and education than there was before PACODET became active.” In 1994 there was a period of rural famine in this part of Uganda, and its impact was keenly felt by those with large families. The children of large families, when compared to those of small families, were generally less nourished, more prone to disease and received far less school education. Indeed, in some large families the younger children received no education at all. PACODET’s extensive team of health and development workers had done much to make people in Pallisa more aware of the linkages between high fertility and poverty. A generation ago large families were considered to be a source of wealth; now they are viewed as a liability. Young couples are much more interested in having fewer but well-educated children than many children without the prospect of a prosperous life.

Returning to the verandah at the front of the dispensary, Tom and Gimono were greeted by a burst of music. Jubilant voices and ringing polyrhythms played on traditional instruments communicated the strength and vitality of PACODET and the Kapuwai community. A choral group of teenage women raised their voices to the accompaniment of an equal number of young men plucking their *adugus* (bow harps) in celebration of what had been accomplished by working together as a whole community. The catchy sounds brought even the oldest women to their feet ululating and exclaiming, “PACODET, hallelujah! Kapuwai!”
A few practical matters

Tom and Gimono stayed on till the end of the week, leaving soon after the inauguration of the health center. It had been a day of great festivity, with up to two thousand people attending the ceremony, but everyone knew that PACODET would have to get back to the hard work of community development as soon as the visitors had gone on their way. Organizing, training, studying problems and testing solutions, as well as providing services – these are the daily preoccupations of the men and women who run PACODET.

PACODET began including environmental issues in early 1993. At that time, it was quite apparent that they lacked information on many subjects, ranging from pesticide use to the amount of wetland in the area. PACODET has since placed emphasis on research and documentation, and staff have carried out a number of research studies in the area on topics ranging from health to alcoholism, sexual behavior to livestock husbandry. Information from these studies, as well as the routine information generated by the monitoring of their own community projects, has helped to shape local plans and activities.

Efforts are currently underway to produce an annual report for circulation to committee members and interested organizations outside the project. There are also plans to produce a small monthly newsletter in the vernacular. This will help PACODET keep the local community abreast of developments.

There is no specific funding to sustain PACODET as an organization. Some funds have been mobilized from various external sources for workshops (e.g., UNICEF, COOPIBO, CARE) and some equipment purchases (e.g., US Embassy, EDF). Other funds have been generated by annual household contributions, charging fees for service in the health unit, and by members of the executive committee participating as consultants in research and evaluation activities for other agencies. More recently, PACODET’s revolving fund and the millet cooperative are yielding some income, which is both generated and managed locally. Key members of the executive and essential staff are supported by PACODET so that they can work full-time on essential activities. Rotation of the PACODET manager post followed advice from outside; rotation of other posts has also been initiated in order to ensure accountability and sound management, as well as to promote capacity-building of many people in the organization.
PACODET exists within an extensive web of linkages – local, national and international. At the local level, the members participate in many other local institutions, such as churches, parent-teacher associations, local political organizations and so forth. The project regularly consults and is consulted by various officials at the district level, both technical (e.g., health, agriculture) and political/administrative. PACODET has been approached by CARE to assist with their activities on reproductive health in the whole of Pallisa district, and collaborative links are maintained with the Child Health and Development Center at Makerere University for capacity-building in research and computer skills. Some international links have also been created through presentations and participation in international meetings. Stanley Okurut, for example, attended a workshop on participatory methods of health research at the Liverpool School of Tropical Medicine.

In 1996, PACODET carried out a successful series of cross-visits for agricultural improvement. They began with community discussions about topics to investigate, places to visit and ways to observe. Questions and ideas were recorded in words and symbols on slips of paper and posted for ease of continuing the discussion. Farmers and staff then got practical experience by visiting other communities in the PACODET area followed by debriefing discussions. After this training and pre-test, three groups were formed (25 farmers per group) and each visited a different district and met with specific projects and farmer groups in those settings. The result has been a big stimulus to agricultural planning and activities by individual farmers and for the organization as a whole.

The story of PACODET is an illustration of what a committed and inspired community organization can achieve when given a moderate level of support at the early stages of appraisal and planning. Today the organization is self-sustaining, and has a tremendous pool of human resources to draw on. Although not every participatory action research process at the community level will result in a large, formalized organization with links at national and international levels, PACODET’s current situation is nevertheless illustrative of what can take place when communities organize themselves to achieve what they care for: environmental protection and better health, income and improved living conditions for the local people.
What the heck is PEC? (continued)

“So, did you manage to have a look at the manual I passed on to you a week ago?”

“You mean Our People, Our Resources?”

“Yes, what do you think?”

“Well… there is lots of wishful thinking in the early chapters, but some of the exercises sound possible, and I found a few examples worth reading. If you want my dispassionate judgment, however, a process such as the one the manual is describing is more difficult to get going than the authors seem to suggest. But it may be worth trying.”

“So, are we going to try it? If you say yes, we may join forces and set up a small PAR support team together. You have been working for a while on environment matters, I was just contracted for two years to support the district health system on primary health care, and the other day I met a new member of the district development committee. She is a very energetic woman and her job mandate is to motivate women’s groups in the district. She mentioned that she would like to collaborate with the health support project. The three of us together have a good basic knowledge of several topics, some understanding of participatory methods (you remember
I worked with NGOs in other districts carrying out participatory assessment exercises) and lots of contacts in the villages, among the district authorities and in the capital. If we prepare ourselves well, we could help start a PAR process!"

“Hey, hey… slow down! All this will require a mountain of time and resources. Who is going to pay? And are you sure that the people in the villages will be willing to participate? What would they get out of it?”

“Someone has to start, do you not agree? You and I and the district lady have a salary, and if we get our superiors to see the advantages of working with the local residents, they may let us take the time. Later on, when we have some plans, we will find some appropriate financial backing. But let us not worry too much beforehand. There are plenty of resources in the district. Regarding the local residents, we will first talk with them, and they will decide. I know the people in your village are fed up with the devastation of the pasture, and I know the kids in many places I visit are not happy about moving to the capital in search of jobs. We should be careful not to make promises we cannot maintain or raise grandiose expectations, but we can work on the basis of their own willingness to get together and discuss. Some of them will not see any benefit from this, but others will, I am convinced.”

“Well, first of all I need to meet the woman you mentioned, and discuss with her whether this has any chance of really happening. Then, I want to discuss the idea with the forestry officers. I am supposed to visit them tomorrow, and will mention your suggestion. Then, I will have to talk with our donor representative in the capital, and get permission to spend more time in the communities. (In fact, now that I recall, she had asked me to do exactly that the last time we met.) If all seems fine, we can go together to discuss with the village people. But not before! Let us try not to put the cart in front of the oxen, for a time!”

“Okay, okay. I just thought that the people in the villages where I am working would be happy to hear about this, and that you would be convinced if you would meet them…”

“You know that there is no easy way to convince me. Only some hard facts would do. And, since we are talking about this, you’ll never convince me to use those acronyms PAR, PEC or whatever else you call these matters. As far as I am concerned, acronyms stink.”

“I don’t care about what we call it. Let the people find a name, whatever they like. For me, I would be satisfied by going ahead with some concrete initiative, no matter the name.”

“I take your point. Let us forget about action research and primary environmental care, and let us get working.”
Annex A: Basic definitions and formulas to describe population dynamics
A.1 Population size and growth rate
   Population size
   Population growth rate

A.2 Gender and age distribution
   Sex ratio
   Age distribution
   Population pyramids

A.3 Births (natality) and fertility
   Crude birth rate
   Fecundity
   General fertility rate
   Total fertility rate
   Completed fertility rate

A.4 Mortality
   Crude death rate
   Infant mortality rate
   Child mortality rate
   Under-five mortality rate
   Life expectancy at birth

A.5 Natural population growth
   Rate of natural increase

A.6 Migration
   Migration balance
   Net migration rate

A.7 Women's status
   Female literacy rate
   Females as a percentage of male enrollment
A.1 Population size and growth rate

For a particular territory, the population size at a given time (a specific date) is calculated using the following formula:

\[
\text{Population size} = \text{Previous population size} + \text{Births} - \text{Deaths} \pm \text{Migration}
\]

This formula shows that the current size of a human population can be estimated if one has four key pieces of information (also referred to as ‘variables’); these are:

- an estimate of the size of the population in the same territory at a previous time; e.g., from a national census done in the past few years;
- the number of births since the estimate was made (e.g., from vital statistics records, if they exist); this is sometimes called the overall natality;
- the number of deaths (i.e., the overall mortality affecting the population);
- migration (i.e., the difference between the number of persons who settled in and those who left the territory during the period of time between the previous size estimate and the present estimate).

Once you have the past and current population sizes, it is a simple matter to calculate the annual population growth rate. Unlike the rate of natural increase (see section A.5 below), the growth rate takes into account all components of population change: births, deaths and migration. It can be calculated as follows:

\[
\text{Population growth rate} = \frac{\ln \left( \frac{\text{Pop}_{t_2}}{\text{Pop}_{t_1}} \right)}{N} \times 100
\]

where \( \ln \) is the natural log, \( \text{Pop}_{t_1} \) is the population at the earlier time, \( \text{Pop}_{t_2} \) is the population at the later time, and \( N \) equals the number of years between the two population estimates (\( t_2 - t_1 \)).
A.2 Gender and age distribution

The distribution by gender within a given population is generally expressed by the sex ratio, calculated as follows:

\[
\text{Sex ratio} = \frac{\text{Total male population}}{\text{Total female population}} \times 100
\]

Ratios lower than 100 indicate a higher proportion of females, and ratios higher than 100 mean a higher proportion of males in a population. A sex ratio value between 90 and 110 is considered demographically ‘normal’ or typical of an undisturbed population. Values lower than 90 or higher than 110 suggest that some factor (such as gender-specific labor migration or war and the death of young males) is affecting the gender distribution of the population under consideration.

In order to portray the age pattern of a population, the age distribution is often portrayed in five basic groupings: less than 1 year old (infancy), 1–4 years, 5–14, 15–44 (reproductive age) and 45+. However, depending on the purpose, the breakdown into age groups can be quite different; for instance, 5–18 for school-age children, or 65+ for the elderly. Because census data for small areas often break the population up into five-year age groups (0–4, 5–9, 10–14, etc.), it may be difficult to obtain the precise breakdown required for specific purposes (such as denominators for the calculation of certain age-specific rates or percentages).

While data on age and gender can be presented in a simple table, a vivid visual representation of the gender and age distribution in a population is given by population pyramids. A demographic pyramid is designed by plotting a horizontal bar graph of the estimated proportions of individuals in each gender belonging to each five-year age group (0–4, 5–10, 10–15, 15–20, etc., up to those ‘over 75’). By convention, bars on the left are used for the proportions of males in each age group, and those on the right for females (see Figure A.1).

On the basis of the shape of the demographic pyramid, three basic types of populations can be identified (Livi Bacci, 1990):

- **A wide-based pyramid** (see Figures A.1, ‘expansive’ pyramid) features a very high proportion of infants, children and young people. This is typical of traditional, non-industrial communities (e.g., most of the rural communities of developing countries). Populations of stable size described by an expansive pyramid are generally characterized by both high birth rates and high mortality, or high outward migration.

- **A wide-waisted or ‘constrictive pyramid’** (see Figure A.1) represents a transitional population, with a higher concentration of individuals in the age-groups between 15 and 40. This is typical of communities undergoing rapid urbanization and/or industrialization (e.g., most urban communities of developing countries). Many such transitional populations feature recently decreased birth rates, together with inward migration (e.g., of job-seekers from other areas).
• A nearly vertical (or straight) pyramid (see Figure A.1) represents a stationary population, in which about half of the population is over 40. This is typical of highly modernized and industrialized communities in developed countries. Such populations show low birth rates and low mortality (i.e., there is a very limited turnover between generations).

Figure A.1
Examples of expansive, transitional and stationary population pyramids
(1990 data)

EXPANSIVE
(KENYA)

CONSTRUCTIVE
(UNITED STATES)

NEAR STATIONARY
(DENMARK)

From: Haupt and Kane, 1991
A.3 Births (natality) and fertility

The number of births occurring in a given population is affected by biological factors, psychological factors (such as the desire to become parents) and economic, social and cultural factors. The basic indicator for measuring natality is the crude birth rate (CBR), which is the annual number of births per 1,000 people in the population. The crude birth rate is calculated as follows:

\[
\text{Crude birth rate} = \frac{\text{Total births in one year}}{\text{Total mid-year population (all ages, same year)}} \times 1,000
\]

The CBR in high-natality countries may be around 45 per 1,000 people; in areas with lower natality, it may be less than 20 per 1,000 (Vaughan and Morrow, 1989).

Fecundity, or the biological capacity to reproduce, is the starting point from which to analyze fertility. Humans have the potential for high fertility: most women over the course of their reproductive years have the biological capacity to give birth to more than ten children (Henry, 1961). The potential fertility (or fecundity) of women is moderated, however, by a number of factors, including cultural patterns (e.g., rules or laws that regulate marriage and sexual intercourse), breast-feeding (which is a natural contraceptive), poor health and nutrition, and other behaviors which prevent conception.

One indicator of fertility is the general fertility rate (GFR), representing the number of births in a given period of time (usually one year) per 1,000 women of reproductive age.

\[
\text{General fertility rate} = \frac{\text{Total births in one year}}{\text{Total women aged 15–44 at mid-year}} \times 1,000
\]

GFR is related to the age-sex structure of the population, the marriage rate, the average age at marriage, the availability and use of family planning methods, the educational and occupational status of women and the overall pattern of socio-economic development. The GFR for Bangladesh in 1974 was 246.7, while in the USA in 1985 it was only 57.8 (Newell, 1988).

A sophisticated statistical analysis of annual GFRs (also known as age-specific fertility rates) can provide a snapshot of the average number of children born to women in a particular territory. This measure is called the total fertility rate (TFR). A simpler (though less accurate) means of obtaining this estimate is to ask a representative sample of women over 45 years about the total number of children they gave birth to in their lifetime (including all except stillbirths). This information can be used to estimate the average number of children in a woman's reproductive life, which is referred to as the completed fertility rate.

In populations with excellent health conditions, an average TFR of 2.1 children indicates (in the long term) a stationary (non-growing or non-declining) population. A higher TFR indicates a growing (transitional or expansive) population. In fact, TFR is a very useful indicator for population projections, as we shall see later in this annex. Changes in fertility levels are a consequence of major changes in behavior, such as use of contraception and specific customs and beliefs, as well as changes in nutritional, economic, epidemiological and other environmental factors.
The World Health Organization (WHO, 1981) states that child mortality reflects:

*the main environmental factors affecting the health of a child, such as nutrition, sanitation, the communicable diseases of childhood, and accidents occurring in and around the home. It reflects even more than the infant mortality rate the level and amount of poverty, and is consequently a sensitive indicator of socio-economic development in a community. Whereas the infant mortality rate may be more than 10 times higher in the least developed countries than in the developed countries, the child mortality rate may be as much as 250 times higher. This indicates the magnitude of the gap.*

**Under-five mortality rate (U5MR)** is an aggregated and concise index of mortality during the early stages of life. It has been officially adopted by UNICEF in order to show the magnitude of the phenomenon of childhood deaths. This rate is calculated as follows:

\[
\text{Under-five mortality rate} = \frac{\text{Total deaths of children under 5 years in one year}}{\text{Total number of live births (same year)}} \times 1,000
\]

Note that the group measured in the numerator is different from that of the denominator; therefore, this measurement is properly referred to as an index rather than an indicator. A comparison among 15 countries with a ‘very high’ or ‘high’ under-five mortality (UNICEF classification) is provided in Table 2.2 (p. 39).

Another important indicator of mortality effect on population dynamics is **life expectancy**, which is the average number of years a person would live if current mortality trends were to continue in the future. This indicator is most commonly expressed in terms of **life expectancy at birth**, i.e., the average number of years a new-born child is expected to survive under the current socio-economic and epidemiological conditions of the community. Life expectancy is a statistical aggregate based on the probabilities of death at specific ages, and hence it is difficult to calculate in relatively small populations. At the local level it is more appropriate to measure mortality by means of CDR, IMR and CMR.
A.4 Mortality

Mortality in a given population can be measured by several indicators, the most common of which are the crude death rate (CDR), the infant mortality rate (IMR), the child mortality rate (CMR) and life expectancy at birth.

The **crude death rate (CDR)** is the number of deaths occurring in a given period of time (usually one year) for every 1,000 persons in that population.

\[
\text{Crude death rate} = \frac{\text{Total deaths in one year}}{\text{Total mid-year population (all ages, same year)}} \times 1,000
\]

Although commonly used to describe populations, the CDR provides little information on people's health status. Comparison of CDRs for populations with different age structures is relatively meaningless, and therefore, where data are available, life expectancy is generally preferred (see below).

The **infant mortality rate (IMR)** is the number of deaths occurring among infants under one year in a given period of time (usually one year) for every 1,000 live births (i.e., not counting stillbirths and abortions).

\[
\text{Infant mortality rate} = \frac{\text{Total deaths among infants under 1 in one year}}{\text{Total number of live births (same year)}} \times 1,000
\]

The World Health Organization (WHO, 1981) stresses that:

*IMR is a useful indicator of the health status not only of the infants, but also of the whole population, and of the socio-economic conditions under which they live. There are great differences in the infant mortality rate between the least developed countries and the most developed countries. There are also wide variations within countries – for example, between different geographical areas, between urban and rural areas, and between populations at different socio-economic levels.*

According to recent data, the country-specific IMR varies from as high as 163 in Afghanistan to as low as 4.3 in Japan (PRB, 1996).

The **child mortality rate (CMR)** is the number of deaths occurring among children from 1 to 4 years old in a given period of time (usually one year) per 1,000 children of that age group.

\[
\text{Child mortality rate} = \frac{\text{Total deaths of 1–4 year-old-children in one year}}{\text{Mid-year population of 1–4 year-olds (same year)}} \times 1,000
\]

Note that a child is 1–4 years old between exact age 1 and exact age 5 (i.e., the date of his fifth birthday).
A.5 Natural population growth

The difference between the number of births and deaths occurring in a given period of time is the **natural population growth**. For the sake of comparison, this is usually expressed as a percentage increase with respect to the population existing at the beginning of the time period considered. This indicator is known as the **rate of natural increase (RNI)** and is calculated using the following formula:

\[
\text{Rate of natural increase (in percent)} = \frac{\text{Crude birth rate} - \text{Crude death rate}}{10}
\]

Note that both the crude birth rate and the crude death rate are per 1,000 population, so the results of the subtraction need to be divided by 10 in order to yield a percentage. RNI estimates are generally calculated on a yearly basis. However, reference to longer periods of time (five or more years) provides more valid estimates of the general trend.
A.6 Migration

Migration is often a significant factor, not only in the demography of small communities, but also affecting the way in which human populations relate to their environment. Immigration and emigration are not, however, usually documented routinely at the local level. If births and deaths are known for the period, this limitation can be overcome by calculating the migration balance (MB), which is the number of ‘in’ or ‘out’ migrants existing in a population at a given point in time (Livi Bacci, 1990). A positive result to the equation indicates immigration flow towards the considered area; a negative value indicates emigration to other areas.

\[
\text{Migration balance} = (\text{Pop}_{t2}) - (\text{Pop}_{t1}) - (\text{Births}_{t1-t2}) + (\text{Deaths}_{t1-t2})
\]

where \(\text{Pop}_{t1}\) is the population at the earlier time, \(\text{Pop}_{t2}\) is the population at the later time, and \(\text{Births}_{t1-t2}\) and \(\text{Deaths}_{t1-t2}\) are the births and deaths during the time period.

On the basis of this rough estimate, the net migration rate (NMR) can be calculated with the following formula:

\[
\text{Net migration rate} = \frac{\text{Total number of migrants in one year}}{\text{Total population at mid-year}} x 1,000
\]

NMR is the simplest means of assessing the quantitative effect of migration flow on local population dynamics. More complete information, including age and gender distribution of the migrants, is usually difficult to obtain. Moreover, each local community is likely to have some unique migration characteristics (e.g., young men in rural southern Africa going to work in the mines; young women in west Africa going to towns for trading). Thus, a household survey is recommended if the NMR is needed (e.g., for planning a specific initiative).

It is important to clarify also what is meant by ‘migration’. People move in and out of their territory of residence all the time, but these movements are considered ‘migration’ only if the person establishes a permanent or semi-permanent residence inside or outside the given territory. Seasonal migration is a variation on permanent migration, which is found in many regions with seasonal agricultural employment with long periods of slackened demand for labor. In this case, it may be possible to measure the number of individuals engaged in this kind of migration, and calculate a seasonal net migration rate.
A.7 Women's status

A key index of women’s status is education. One very important educational indicator is the female literacy rate (FLR) (i.e., the total number per 1,000 women aged 15–45 years who are actually able to read and write in the national or local language):

\[
\text{Female literacy rate} = \frac{\text{Total number of literate women aged 15–45}}{\text{Total number of women aged 15–45}} \times 1,000
\]

In addition to the female literacy rate, other indicators of female education can be very useful to consider, such as: percentage of girl children enrolled in primary school at the proper age, percentage of female drop-outs during primary school, percentage of girls enrolled in secondary school. Females as a percentage of male enrollment for primary or secondary schooling can also be a good indicator of any sex preferences that the society has for education.

\[
\text{Females as a percentage of male enrollment} = \frac{\text{Number of girl pupils (at a given level)}}{\text{Number of boy pupils (at a given level)}} \times 100
\]

Where the percentage is under 100, there are more boys than girls, and where it is over 100 there are more girls than boys.
Annex B: Basic methods and tools for PAR on population dynamics and the local environment
B.1 Transect walks and diagrams
B.2 Participatory mapping
B.3 Historical mapping
B.4 Interviews with natural groups
B.5 Focus group discussions
B.6 Semi-structured interviews
B.7 Group brainstorming
B.8 Ranking exercises
B.9 Priority-setting exercises
B.10 Strengths, weaknesses, opportunities and limitations (SWOL) analysis
B.11 Role-playing
B.12 Slide language
B.13 Gender analysis
B.14 Some tips on good facilitation
B.1 Transect walks and diagrams

One of the tools for gaining hands-on experience in a community is to take an observational walk, i.e., a walk during which attention is specifically paid to people, activities, resources, environmental features, etc. Observational walks may be taken in a meandering way, following a particular feature of the landscape or the interests of the observer(s). The walks can also be structured as a transect, i.e., a straight line cutting across the terrain in a specific way, such as a compass direction. Walks of these kinds help to verify the information provided on maps, both through direct observation and in discussions with people met along the way. Ideally the walk is organized for a small group, so as to maximize the opportunities for interactions.

Purposes
There are several types of transects, among which two broad categories are social and land-use transects. The former concentrate on housing types, infrastructure and amenities, religious and cultural features and behaviors, economic activities, skills and occupations. The land-use category focuses on environmental and agricultural features (such as cultivated land, forests, ranges, barren land and erosion phenomena, streams, bodies of water, types of soil and crops). A typical transect takes in a combination of social and land-use information.

Steps in using the technique
• Decide what issues to focus on and the information that needs to be gathered.
• Agree with the relevant interest group who will take part in the transect walk and discuss with them the purpose of the exercise.
• During the walk, take notes on relevant features observed; seek clarifications from local people; discuss problems and opportunities.
• After the walk, meet with participants to discuss notes; involve participants in drafting a transect diagram to be used for further discussion and feedback to the community at large.

Strengths and weaknesses
+ Transect walks are a highly participatory and relaxed technique.
+ They enhance local knowledge and can also be used in low-literacy communities.
+ They may be extremely useful in validating findings of participatory mapping exercises.
– Transects may be time-consuming.
– Good transect diagrams require some graphic skills.
B.2 Participatory mapping

Participatory mapping starts with collective discussions among groups of community members and then proceeds to drawing maps of their perceptions about the geographical distribution of environmental, demographic, social and economic features in their territory. The participants are usually requested to draw their own map, e.g., on a flipchart or on the ground, plotting features with symbols that are understood and accepted by all members of the group, regardless of literacy. In certain cases, purchased maps, aerial photographs or basic drawings on paper or on the ground can be used as a basis for the participatory exercise.

**Purposes**

Participatory mapping is useful for providing an overview (or ‘snapshot’) of the local situation. It can also serve as a good starting point for environmental and social assessment. Periodically repeated participatory mapping may help in monitoring and evaluating changes in the distribution of social resources (e.g., infrastructures like schools and health units) and in the use of natural resources. ‘Historical’ and ‘anticipated future’ mapping (i.e., drawing a series of maps referring to different moments in time) are versions of participatory mapping that are helpful in describing and analyzing trends over time (see section B.3).

**Steps in using the technique**

- Explain the purpose of the exercise to the interest group.
- Agree on the subject of the mapping exercise and on the graphic symbols to be used; participants choose their own symbols.
- Ask a participant to be responsible for drawing or plotting symbols according to the suggestions of the group.
- Promote participation of all interest group members by posing questions to several individuals; allow the group to discuss different opinions and perceptions.
- Once the map is finalized, ask participants to interpret the overall picture; if appropriate, suggest that they identify the main problems revealed by the map and ask them about possible solutions within the locally available resources (which are already drawn, or could now be drawn, on the map).
- Remember that the map is community property; leave the original in the community and make copies of it if other uses are foreseen.

**Strengths and weaknesses**

+ Mapping and the associated discussions quickly provide a broad overview of the situation.
+ They encourage two-way communication.
+ They help people in seeing links, patterns and inter-relationships in their territory.
+ Individuals who are illiterate can also participate.

- Subjectivity and superficiality: mapping exercises must be complemented by information generated by other participatory assessment tools.
- Some cultures may have difficulties in understanding graphic representations.
B.3  Historical mapping

Historical mapping uses a series of participatory mapping exercises to portray the demographic and natural resources situation of the community at different moments of its history. Usually, three maps are drawn, showing the situation as it existed one generation ago, at the present time, and what is expected after one generation’s time in the future. Demographic information can be plotted as household symbols or circles to represent 10 or 100 people.

Purpose

Historical mapping can be extremely helpful to introduce the time dimension in participatory environmental appraisal and/or participatory census exercises. It can provide visual evidence of changes that have occurred and expected trends. In this way it can help identify determinants of environmental degradation and population dynamics and enables participants to consider suitable means of moving towards a desired future.

Steps in using the technique

- A map of the current demographic and environmental situation is drawn with participants.
- With the help of elderly community members, the same exercise is repeated to show the situation as it was approximately twenty years ago.
- The current and past maps are then compared, often with a brainstorming, to collectively identify major changes and their root causes.
- Based on the list of changes and causes, a prospective map can be drawn by the participants to show their expectations of the situation which will exist in the community in 20–30 years from now, if the current trends are maintained.
- The future map can be reviewed to explore differences between what is projected and what a desirable future status would be. The discussion can progress to identify potential means for addressing environmental degradation and population dynamics.

Strengths and weaknesses

+ The technique can be very appropriate to summarize the results of a comprehensive participatory appraisal on environment and population dynamics.
+ It may increase participants’ understanding that most positive and negative changes in environments and populations are shaped by historical, man-made actions.
+ It can help to identify mid- or long-term solutions to the population and environment problems affecting the community.

- The exercise is long and complex. Three sessions with the group may be needed to get through the whole sequence of mapping and discussion.
- Sensitive issues from the past may be raised, including conflicts within the community and between the community and outsiders.
- The analysis is likely to identify effects and causes which are beyond community control. Discouragement and frustration may develop among participants.
B.4 Interviews with natural groups

Natural groups interviews are casual conversations with groups of people met during observational walks and other forms of participant observation sessions. Typical natural groups might be peasants working in their fields, mothers fetching their children from school, people queuing for a bus, traders and customers at the market, patients waiting in a health unit, etc.

**Purposes**
Natural group interviews are a suitable means to get verbal comments about the situation in which the actors are engaged. They help to discover problems and expectations related to the situation as perceived by local actors, as well as common interests leading individuals to cluster in small groups.

**Steps in using the tool**
- Make a list of settings where natural groups can be observed in the community, and the types of groups which seem to gather in those locations.
- Identify the groups likely to be most concerned with the topics of interest.
- Develop a set of open-ended questions you would like to address to the group.
- Find an opportunity to engage in conversation.
- Introduce into the conversation some of the key open-ended questions.
- Do not take notes during the conversation, but make a summary of the information obtained from the natural group as soon as the interaction is finished.

**Strengths and weaknesses**
+ The technique helps to focus participant observation activities.
+ It provides important hints about local views on the issues of interest.
+ It helps to establish preliminary contacts and personal relationships with local people.
+ Group interaction enriches the quality of the information which can be elicited.

- Good communication skills are needed to get the most out of this technique.
- To avoid improper behaviors, some previous understanding of local etiquette is necessary.
- As people may not be willing to share all their ideas with an outsider, answers may be colored by what they think the outsider expects to hear. A countercheck of the perceptions collected through this technique is essential.
B.5 Focus group discussions

Focus groups are semi-structured discussions with a small group of persons sharing a common feature (e.g., women of reproductive age, shareholders in an irrigation system, users of a public service, etc.). A small list of open-ended topics, posed as questions (see example in Table 4.7, p. 136), is used to focus the discussion.

Purposes

Focus groups have been increasingly used in participatory research to identify and describe insider perceptions, attitudes, and felt needs. They are a crucial technique in participatory action research.

Steps in using the technique

- Prepare a discussion topic guide (interview framework); decide on the number of focus groups; in a small community, two groups of 6–12 persons each and representing key different categories (e.g., men and women, peasants and herders, wealthy and poor, etc.) may be sufficient.

- Select appropriate facilitators; this may involve matching by age, gender or language ability (focus groups are best done in the local vernacular); the interviewer acts as a group facilitator, and a second person acts as a rapporteur (note-taker); the rapporteur needs to write rapidly to capture people’s expressions as exactly as possible; it may be useful to tape-record the session, but only if the community and the group are comfortable with it and give explicit permission.

- If possible, test your topics with members of a similar nearby community to improve formulation and communication.

- Before starting, explain the purpose of the session to the group; after posing topics, be sure each person has at least one opportunity to provide ideas; if some participants dominate the discussion, it may be necessary to pose questions directly to one or more of the less talkative participants.

- As with semi-structured interviews (see section B.6), the facilitator is free to use a variety of probing questions to help extract ideas and to keep the talk focused; limit the length of the session to about one to two hours (including introduction).

- Notes and recordings of interviews should be carefully reviewed immediately after the session (and tape-recordings transcribed as soon as possible).

- Analysis consists of extracting information, views and attitudes from the discussion; vivid and expressive statements should be recorded as phrased by the participants; local interpersonal dynamics should also be recorded and assessed.

Strengths and weaknesses

+ Group interaction enriches the quality and quantity of information provided.

+ Focus group discussions are quite good at disclosing the range and nature of problems, as well as eliciting preliminary ideas about solutions.

- Practice and experience in qualitative research procedures is needed.

- Large amounts of information are easily obtained, necessitating skills in extracting and summarizing for the analysis.
**B.6 Semi-structured interviews**

Semi-structured interviews are lists of broad, open-ended questions to be addressed to knowledgeable individuals in a conversational, relaxed and informal way. The interviewer is left free to rephrase these questions and to ask probing questions for added detail (e.g., ‘Who?’, ‘Where?’, ‘When?’, and ‘How?’) based on respondents’ answers and conversation flow. This form of interview is much more likely to yield in-depth opinions and perceptions than a closed-ended questionnaire.

**Purposes**

Semi-structured interviews can be used to obtain specific, quantitative and qualitative information. Household features, gender-related issues, use of natural resources, household economics and many other topics can be effectively explored by this technique.

**Steps in using the tool**

- Design an interview guide and a summary form; decide who is going to be interviewed (purposeful sampling procedures) and select appropriate interviewers (this may mean matching respondents and interviewers by age or gender, depending on topic and local cultural values).
- Pre-test the questionnaire guides with several individuals who are representative of the types of persons to be interviewed in the actual study (make sure the questions are comprehensible, etc.).
- Conduct a training for all persons who will be doing the interviews (i.e., the interviewers); be sure the training includes a number of practice interviews with other interviewers or community members and subsequent reviews to improve performance.
- Teach the interviewers to make relatively brief notes during the interview, filling out the summary form immediately after the interview; this will require practice to capture exact words and phrasing for quotations.
- Arrange for daily (or nightly) editing of all forms for completeness, errors, etc.; hold daily discussions about problems encountered during the interviews, and to review the preliminary results with other members of the team.

**Strengths and weaknesses**

+ Less intrusive than questionnaires; can be paced to fit the needs of the respondent.
+ Encourages two-way communication.
+ Administered in an atmosphere that makes respondents feel at ease, which may include privacy and confidentiality, depending on topic.
+ Can obtain very detailed information and rich quotations.
- Practice and experience are needed for appropriately using this tool, which requires sensitivity and the ability to recognize and suppress one’s own biases.
- Interviewers should have good literacy, communication, and summarizing skills.
- Interviewers will need some grasp of the general topics covered in the interview.
- Facilitator support is needed for analyzing data.
B.7 Group brainstorming

Brainstorming is a basic idea-gathering technique employed in many group exercises. It is based on a free-wheeling discussion started by an open-ended and somehow provocative question forwarded by the facilitator. Opening statements should be general and non-leading, i.e., should not stress or overemphasize a particular point of view that can bias the ideas of the participants. It should be clear that brainstorming is a free and non-committal way of exploring ideas, i.e., no one commits themself to something by suggesting as a potential solution an issue to explore.

**Purpose**

Brainstorming can elicit multiple ideas on a given topic, and the group discussion that usually follows it can help group members explore and compare a variety of possible ‘solutions’.

**Steps in using the technique**

- The issue to be discussed is introduced by the facilitator; the key question is written on the blackboard or on a flipchart.
- Participants are asked to provide short answers, comments or ideas, i.e., no speeches at this stage; at times participants can provide ideas written on cards (only a few key words) which are then pinned to a wall.
- An important point to stress at the beginning is that ‘all ideas are good ideas’; if anyone does not agree with someone else’s point, they should give what they think is a better idea; accept only additional contributions during the brainstorming, not disagreements or arguments; defer those to the discussion afterwards; encourage fresh ideas rather than repetitions of earlier items.
- Each participant is allowed to express his/her view; over-talkative participants will need to be quieted, and silent participants can be explicitly asked for ideas.
- The facilitator picks the basic point out of participant statements and ensures that it is written (or portrayed with a picture) on the blackboard or flipchart; appropriateness of the summary is checked with the concerned participants.
- Keep the brainstorming relatively short: 15–30 minutes is usually sufficient to obtain most of the ideas on a specific topic without tiring the participants.
- Review the results with the participant group; remove duplicated items and cluster groups of similar ideas; highlight differences of opinion and discuss those until a list of clearly described ideas is achieved; record (or summarize) the results of the brainstorming and keep them for future reference.

**Strengths and weaknesses**

- A properly conducted brainstorming facilitates participation of all group members in the idea-building process.
- A large number of ideas and solutions can be generated quickly.
- It is a good introduction for more structured and focused exercises.

- Experience in dealing with group dynamics – as well as good mediation and summarizing skills – is needed by the facilitator to keep the discussion on track.
- Conflicts and uneasiness within the group may limit the brainstorming results.
B.8 Ranking exercises

Ranking exercises, which may be done with groups or individuals, are a way to enable people to express their preferences and priorities about a given issue. When followed by a discussion of the 'reasons' for the ranking, the technique may generate insights about the criteria through which different individuals, groups or social actors make decisions on the kinds of issues of interest.

Purpose
Ranking exercises have been used for a variety of purposes, such as:

- identification of priorities and preferences;
- quantification of opinion and preferences elicited through interviewing or brainstorming;
- comparison of preferences and opinions as expressed by different social actors.

Steps in using the tool

- Make a list of items to be prioritized or obtain a list of items generated by other exercises and recruit the participants to be involved in the exercise.
- Define a simple ranking mechanism. This may be based on a pair-wise comparison of items in the list ('Is A better than B?'), on sorting cards representing items in order of preference, or on assigning a score to the different items.
- Prepare a matrix on which preferences identified by participants could be jotted down (e.g., on the ground, with a flipchart, on a chalkboard).
- Explain the ranking mechanism to each participant and ask them to carry out the exercise (e.g., give them three stones to place on any categories they want in response to a specific guiding question – which crop is the most difficult to raise, which problem to solve first, etc.).
- Ask participants to explain the criteria on which their choice has been made ('Why is A preferable to B?).
- Synthesize the ranking results (e.g., count how many times an item has been preferred with respect to others) and list the criteria of choice.

Strengths and weaknesses

+ Ranking is a flexible technique which can be used in a variety of situations and settings.
+ Whenever categorical judgments are needed, ranking is a suitable alternative to closed-ended interviewing.
+ Ranking exercises are generally found to be amusing and interesting by participants and are helpful in increasing their commitment to action-research.
+ Information is provided on both the choices and reasons for the choices.

- Pre-testing is needed for the ranking mechanism and the tools to be used to facilitate it.
- Choices may be affected by highly subjective factors. In order to generalize results to the whole community, a proper sampling strategy is needed.
B.9 Priority-setting exercises

Priority-setting exercises are used to reach a group decision on courses of action to be adopted. After a brainstorming about the pros and cons of several possible alternative courses of action, each participant is asked to evaluate them according to two or more criteria (e.g., effectiveness, feasibility, efficiency, visibility, closeness to community concerns, etc.), and using a scoring system.

**Purposes**

Like other scoring and ranking techniques, these exercises may be used when individual opinions must be consolidated into a group decision. They have proved useful for planning and, especially, for decision-making by a group.

**Steps in using the tool**

- Draw a priority-setting matrix on a flipchart or blackboard, leaving spaces for possible actions on rows and drawing columns for all chosen criteria; clearly explain the criteria to be used for ranking the courses of action.

- Ask the group for possible actions to be evaluated and list them in the left column of the matrix; call for a brief explanation of each action.

- Distribute scoring cards; each member gets one set of cards for each of the scoring criteria (e.g., ‘effectiveness’, ‘feasibility’, etc.); the number of cards in each criteria set must be equal to the number of actions being ranked, for example, if there are four actions, then each criteria set should contain a number from 1 to 4; when asked to assess the ‘effectiveness’ of a specific action, the member must hand in (or display) the appropriate card to the facilitator (i.e., if the participant feels that the action is the most effective of the four, then he or she will hand over the card marked ‘4’ from the ‘effectiveness’ set); the same procedure has to be repeated for each action and each criteria; scoring cards with labels and different colors may help to avoid confusion.

- Once a course of action has been evaluated, for all criteria, by all participants, jot down the scores in the matrix and then return the cards to the participants; after all repetitions, total the individual scores by criteria and report the totals in the right column of the matrix.

- Ask participants to comment on the final results; clearly explain that the scores are meant to assist in decision-making, but that they do not provide the final solution; support participants in making a final decision by encouraging them to consider both the trends revealed by the total scores and the comments and suggestions resulting from the discussion.

**Strengths and weaknesses**

+ Priority-setting exercises help groups to identify the main thrust of their collective opinions, instead of just individual views.

+ They contribute to reaching a consensus on controversial issues.

- The final decision may be too heavily influenced by the scoring mechanism (e.g., a criterion not listed is forgotten, a criterion listed is taken as paramount).

- Because of the complexity, a few trials may be needed at the beginning for the participants to learn the system.
B.10 Strengths, weaknesses, opportunities and limitations (SWOL) analysis

SWOL analysis is a powerful tool for group assessment of an issue of concern, in particular interventions or services. It is based on a structured brainstorming aimed at eliciting group perceptions of the positive factors (strengths), the negative factors (weaknesses), the possible improvements (opportunities) and the constraints (limitations) related to the issue.

Purpose

SWOL analysis is especially useful for evaluating activities carried out in the community. It can be focused on services provided by external agencies, as well as used for self-evaluation of the interest group’s own performance.

Steps in using the tool

• A four-column matrix is drafted on the blackboard or on a flipchart and the four judgment categories are explained to participants; it helps to phrase the four categories as key questions, to which participants can respond; the issue of concern is written on top of the matrix (if it is the only one to be considered), or on the side, if several items will be SWOL-analyzed.

• The facilitator starts the brainstorming by asking the group a key question about strengths; responses from the group are jotted down on the relevant column of the matrix.

• When all points of strength are represented, weaknesses, opportunities and limitations are also identified by the group.

• Participants may have different opinions about an issue, and contradictory statements may be expressed; in such cases, the facilitator can work towards a consensus, which may require a point to be discussed at some length; each entry is left on the final matrix only after achieving a group agreement.

Strengths and weaknesses

+ The technique stresses consideration of different sides (positive and negative) of the issues. It therefore helps to set the basis for negotiations and trade-offs and promotes understanding of the views of others.

+ SWOL is a good means to discuss an issue in detail within a group and to prepare the group to discuss with outsiders.

+ SWOL can promote group creativeness. It helps to link perceptions of things as they are with realistic expectations about how things could be.

+ ‘Strengths’ and ‘weaknesses’ tend to be more discriptive and easier for respondents to identify.

- ‘Opportunities’ and ‘limitations’ (i.e., threats, constraints or barriers) are more analytical concepts and may be hard to elicit.

- Sensitive topics and differences of opinion may arise during the discussion.

- Some group members may attempt to dominate the discussion.

- Facilitator needs good synthesizing skills.
B.11 Role-playing

Role-playing consists of simulating events or interactions in a safe, make-believe setting with the aim of identifying (and sometimes altering) attitudes and behaviors which enhance or hamper the flow of communication in real life.

**Purpose**

Role-playing is helpful in training members of action-research teams and/or interest groups in communication skills. It may be used to develop simple theater sketches as entry points for involving a bigger audience in a discussion of social roles and communication behaviors.

**Steps in using the technique**

- Prepare a set of notes for the simulation exercise; the setting and roles to be played should be clearly defined (i.e., village nurse and mothers of children to be immunized).
- Prepare an observation checklist of features to be observed and assessed (i.e., Are the mothers made comfortable? Is the nurse capable of passing on a clear message?).
- Ask participants to form two sub-groups; make it clear that the exercise will be repeated and that each participant will have the chance to act as a performer and as an observer.
- Allow each sub-group to prepare a performance.
- The first group makes its performance and is assessed by the second group; comments are jotted down on the blackboard.
- The same process is repeated with the second group acting as performers and the first as observer/evaluators.
- The groups together discuss what can be done to improve communication in the setting that has been acted.

**Strengths and weaknesses**

+ Role-playing is a powerful tool for identifying and acquiring communication skills.
+ Exchanging roles in the exercise allows participants to experiment and realize the interactive nature of communication processes.

- An experienced facilitator is needed to manage the group dynamics which may arise from the exercise.
- A good performance in the simulated setting does not necessarily mean that the same level of communication will be achieved in real life.
B.12 Slide language

Slide language (i.e., participatory picture-taking and slide shows) can be an effective tool for raising awareness about the local situation and promoting reflection. Insiders are trained to use a simple camera to take pictures of relevant features and events in their own environment and community. These pictures are then shown to interest groups and/or used at community meetings. Participants are asked to comment on the images, to tell a story related to them or to identify positive and negative aspects of the object, situation or event shown.

Purposes

Slide language can be used for a variety of interactive purposes such as participatory environmental assessment, gender analysis, evaluation of services or appraisal of traditional and new technologies. Slide language should not be confused with the use of pre-developed audio-visual materials for demonstration or didactic purposes.

Steps in using the tool

• Train members of an interest group in using the camera and in composing and selecting significant images (some practice may be needed).

• Decide the purpose of the session and collectively prepare a list of relevant scenes to be photographed; try to clarify with the group what each image is meant to show; using this information, draft a written text to accompany the slides.

• Assist the group in taking pictures; each image may be taken from three or four different angles, by different group members and under different light conditions (this will increase the chances of producing good-quality slides).

• After developing the slides, meet with the group and assist them in selecting the images they would like to show; images should be relevant to the written text, meaningful, easily recognizable by the audience, and of good technical quality; eight to twelve good slides are sufficient for a session.

• Start the session by explaining its purpose; prepare relevant key questions for each image to be used in promoting discussion; project each slide for enough time so that details can be identified and discussed.

• Take notes on the main points of the discussion. Use them for wrapping up the session so that a list of the problems elicited by the slides and possible solutions is agreed upon before its conclusion.

Strengths and weaknesses

+ Slide language is a creative and participatory way of visual portrayal.

+ It enhances local knowledge and can also be used in low-literacy communities.

– Slide language is a relatively expensive tool. Cameras, slide films, a good projector and often a portable generator are required.

– It may take some time for the tool to be properly effective. During the first sessions participants may be more attracted by the ‘show’ than by its subject matter.
B.13 Gender analysis

Purpose
Gender analysis in an initiative dealing with population dynamics and the local environment helps to illustrate the difference in the ways men and women contribute to population dynamics, perceive it and are affected by it, and how they use natural resources, rely on them, and have access to alternatives. It also helps to make explicit the constraints (financial, legal, cultural, etc.) that differentially affect the ability of men and women to respond to, and participate in, common initiatives.

Steps in applying this process
Gender analysis can refer to any topic and be incorporated in all types of tools and processes, including: natural group interviews, gender-based interviews (natural group, focus and key informant), seasonal calendars, trend analysis, mapping exercises, household interviews, informal discussions, and so on. First, it is important to access and record data in ‘disaggregated’ and specific terms with respect to men and women. In other words, questions should probe in detail, for instance:

- Who migrates?
- Who wants large (small) families?
- Who is benefiting from large (small) families?
- Who is paying the price?
- Who has access to what resources – finance, equipment, land, natural products, etc.?
- Who uses which natural resources and for what?
- Who carries out which tasks?
- What role do women (men) play in decision-making about resource use?
- What is getting better for the women (men)?
- What is getting worse for the women (men)?

Second, both men and women should be allowed to provide their answers and their views, if necessary in separate meetings. In some cultures, women are reluctant to attend meetings and to speak their minds. In these cases, a woman facilitator may assist in rather informal gatherings and use great sensitivity to let the women find out for themselves what they wish to discuss and how.

The information collected through the gender analysis will have explicit reference to women and men and help with identifying – and possibly redressing – existing imbalances and inequities. In fact, gender analysis could be the basis of gender-based planning, in which women and men present their concerns as separate interest groups.
**Strengths and weaknesses**

- Gender analysis ensures that the knowledge of both women and men is made available in the design and management of community initiatives.
- It explicitly acknowledges the importance of the role and contributions of women (not a 'given' in many communities).
- It protects women from having to bear unforeseen and unacknowledged costs which may result from community initiatives.
- It enables constraints on women's participation to be addressed.

  - Patient and sensitive facilitation is required if women show reluctance to participate (due to shyness, male opposition, etc.).
  - Addressing gender differences may be seen as a threat or criticism of the local culture and cause some resentment.
B.14 Some tips on good facilitation

There is an old saying about working together: We can accomplish anything, as long as we don’t worry about who receives the credit.

Encouraging people
Facilitators guide a participatory process by asking questions and refraining from stating their own opinions or instructing participants in answers presumed by them to be correct or incorrect. Their job is to stimulate the people to think and act in a self-reliant manner. It often means convincing people that they have an important role to play in their communities. Facilitators enable people to get into the habit of trusting their own ideas and organizing for action.

Many people, perhaps most, are shy in expressing themselves in public. In some cultures, this is especially true of women and minorities. A lot of encouragement (not necessarily verbal) from facilitators is needed for such people to speak. Facilitators assure them that their ideas are important. Even the slightest hint that their ideas might not be valuable discourages some folks from actively engaging in a discussion. A facilitator, therefore, never rejects a response. There are no ‘wrong’ answers. Everyone has something to contribute and every contribution has an insight at its core.

This does not mean that every contribution is easily understood when it is first presented. Many ideas may be expressed in convoluted or unclear terms, especially by people who have too little (or too much) experience in public speaking. The facilitator’s job is to make sure that the concerns someone is trying to convey are actually expressed and understood.

Facilitation is difficult because its style is contrary to much development work. Facilitators must break the conventional mold of a teacher or extension officer. Educators in the developing world are often trapped by the ‘anti-participatory orientation’ found in post-colonial schools, while extension officers tend to become ‘salesmen’, hawking predetermined plans from a central development office. Neither serves as a good model for a facilitator.

Becoming a good facilitator is an on-going process that involves continual learning. No one is simply born a natural facilitator. Facilitators work as a team and learn from one another. The most valuable training they receive is ‘on-the-job’ training. Good facilitators are continually reflecting on their performance and on how they might be able to improve their skills.

The major challenge of a participatory process is to discern the minimum level of facilitator support that still allows it to be an effective catalyst for self-reliant initiative. A systematic pattern of monitoring visits can accomplish this. Many facilitators, however, are tempted to skimp on follow-up work so that they can conduct new seminars in additional communities. This tendency must be strongly resisted.

Probing for detail
A typical problem encountered in planning workshops is the one of abstraction. Hopes and dreams are stated so vaguely that they become mere indicators of a broad, general direction – thereby losing the compelling power of bold but concrete visions. Abstract statements can be transformed into specific vision statements by asking, “What would we see if this was to happen?” Take, for example, a statement about ‘improved health’. A facilitator might ask, “If we were to return in five years and take a picture of new developments
in health/health care, what would we see in the photographs?” Caution would have to be maintained to keep the responses realistic; it is doubtful if most rural villages can establish their own dispensary and clinic with a doctor. Realistic answers might include: “Pit latrines at every home,” “Education classes in sanitation and hygiene,” etc.

Below are some typical abstract vision statements followed by some statements that are more concrete and substantial. These are merely examples and are not intended to be ‘right answers’. Every group will have its own unique perspective on its vision. Remember, a good vision statement describes a reality that can be seen.

<table>
<thead>
<tr>
<th>Vision ‘abstractions’</th>
<th>Vision of ‘substance’</th>
</tr>
</thead>
<tbody>
<tr>
<td>improved transportation</td>
<td>new trailer for tractor</td>
</tr>
<tr>
<td>modern farming techniques</td>
<td>terraces on hillsides</td>
</tr>
<tr>
<td>good health</td>
<td>well-fed children playing in a safe kindergarten</td>
</tr>
<tr>
<td>new sources of income</td>
<td>opening of a tea shop, a business to sell bamboo shoots in the city, a carpentry workshop</td>
</tr>
<tr>
<td>better education</td>
<td>a stable teacher for children in secondary school</td>
</tr>
</tbody>
</table>

Statements about obstacles describe underlying causes that are preventing the village’s hopes or plans from being realized. Just as weeds in the fields must be pulled up by their roots, obstacles, too, have root causes which must be addressed if they are to be overcome. Though obstacles are often referred to as ‘problems’, they are really windows to the future showing a group where they need to move.

‘Lack of money’ is one of the most frequent items to appear in brainstorming sessions on obstacles. But insufficient funds is a surface reading of the problem. After all, most communities will never reach a point where people will be satisfied with available funds. The challenge of the facilitator is to ask questions that enable participants to look beyond the surface toward the contributing causes for a shortage of funds over which they have some control. These may include poor financial planning, unprioritized expenditures, unaccountable use of funds, untapped opportunities for income generation, etc.

Obstacles are real problems that are blocking progress toward the vision like a fallen tree in the road. They are not empty phantoms as ‘lack of’ statements seem to imply. When boarding a rural commuter bus in the rain, a passenger sees very concrete problems: bald tires, broken windshield wipers and unmarked roads rather than ‘lack of safety’. If participants say ‘lack of’ something is a problem, facilitators can enable concrete statements to emerge by asking about the underlying causes.

Below are some examples of shallow obstacle statements and some more revealing counterparts. As before, these provide facilitators with some illustrations of good obstacle statements and are not meant to be definitive of every group’s experience.
<table>
<thead>
<tr>
<th>'Superficial' obstacles</th>
<th>'Underlying' obstacles</th>
</tr>
</thead>
<tbody>
<tr>
<td>lack of education</td>
<td>poor attendance at literacy classes because few people know about them</td>
</tr>
<tr>
<td>not enough money</td>
<td>unaccountable use of funds</td>
</tr>
<tr>
<td>selfishness</td>
<td>few benefits of co-op membership</td>
</tr>
<tr>
<td>floods</td>
<td>deforestation and overgrazing</td>
</tr>
<tr>
<td>poor management</td>
<td>late ordering of fertilizers</td>
</tr>
<tr>
<td>lack of cooperation</td>
<td>irregularly called meetings</td>
</tr>
</tbody>
</table>
Annex C: Using a computer for demographic projections and map-making
C.1 Using a computer for demographic projections: wanting to know what lies ahead
Inputs and outputs
An illustration: the future implications of changing fertility
Resource: Demproj demographic projection software

C.2 Using a computer for map-making and GIS
Resource: Map Maker for Windows
C.1 Using a computer for demographic projections: wanting to know what lies ahead

One of the things a community may wish to know is what the local population will be in 10, 20 or even 50 years. How many school-aged children will we have when our children are young parents? How many people will be of working age, or old age (over 65)? What will happen if the new migrants keep coming in?

These questions can be answered easily and precisely using demographic projection programs that have been designed for use with small computers. With such a program, the user can obtain a projection of population by age and sex for 5 to 50 years after the base or beginning year. The user decides on the base year and the number of years for the projection, and can also make a few assumptions concerning future trends for birth and death rates. It should be stated at the outset that a projection is only as good as the assumptions upon which it is based. However, the advantage of using computers is that the assumptions can easily be changed from one projection to the next to see the implications of different patterns of births or deaths on future population size and age distribution.

Projections can be obtained on urban and rural populations separately, and on populations of specific areas of interest, such as a local community. Migration can be taken into account, with the user deciding on either current migration rates, or different assumptions of flows of migrants. Some of the programs can provide information on the future impact of AIDS, if the user can provide basic information on current infection rates and assumed future rates. In these ways, the computer programs can be a good tool for helping communities see the future implications of population interventions.

Inputs and outputs

The basic inputs for running computer projections are the key population indicators discussed in Annex A:

- **population size**, including the date of the information, and the distribution by age and gender, i.e., numbers of males and females for five-year age intervals: 0—4, 5—9, ..., 80+. Such data are usually available from national population censuses down to province or district levels, and sometimes even for small communities. The information could also come from a participatory community census.

- **total fertility rate** (TFR): one can use the UN-projected TFR, or choose a different one. If available, one can use a full set of age-specific fertility rates.

- **mortality** data, either as age-specific death rates, or choosing a life table and entering simpler assumptions of life expectancy at birth for men and women, again by five-year intervals.

- **migration rates**: best if age-specific migration rates, usually obtained from the participatory assessment of the actual community. This is important for small communities, which can be overwhelmed by relatively small amounts of immigration, or badly weakened by even small amounts of out-migration.

The basic outputs are tables of numerical data or graphs showing total population, or numbers for specific age groups for the selected time into the future. These programs can also show projected numbers of births or deaths, or summary demographic statistics and age-sex pyramids.

By inputting different data or assumptions, it is possible to compare alternative future outcomes in the community. This is especially useful because it shows clearly and dramatically what are the future implications of different real conditions or interventions. For example, one can see the future implications of conditions that might be controlled with specific programs, such as death, fertility and migration rates. With appro-
appropriate consideration given to local cultural sensitivities, one can generate tables and graphs of future population scenarios, and use these to stimulate group discussion.

**An illustration: the future implications of changing fertility**

The following illustration shows how such a computer program could be used. For example, the issue of children, family size or family planning might come up in a participatory appraisal. One of the questions that commonly arises is ‘What will the future hold if things continue as they are, if we continue to have the same numbers of children or the same family size?’

The following is an example to illustrate both what a projection program can provide, and what are some of the important lessons that can be learned from such an exercise (see Annex A for definitions of terms).

Take two hypothetical (make-believe) communities, with demographic characteristics that are quite common for many developing countries. They both begin in 1970 with 2,100 people, and slightly more females than males. They have age-sex distributions common among communities with high fertility and recent rapid declines in mortality. They are both at relatively high total fertility rates (TFR 7.00). In mortality, Community 2 begins with slightly lower rates and a moderate advantage: crude death rates for Community 1 and 2 are respectively 26 vs. 16, and infant mortality rates are 167 vs. 127.

Then we assume that Community 1 shows very slow declines in both mortality and fertility. Infant mortality declines slowly, remaining above 100 until after 2005, and life expectancy for males and females together increases only slowly from 38 to 58. The total fertility rate declines only gradually down to 5 by the year 2020. This is, in fact, a scenario close to that projected for a typical poor rural community without any specific local interventions.

We assume that Community 2 shows the kind of rapid decline in mortality and fertility that Thailand showed after 1965. Infant mortality goes down from 127 to 37 in 25 years, and life expectancy for males and females together rises in that same period from 49 to 73. The total fertility rate declines from 7 to replacement level in 25 years (1970–95). Not only Thailand, but South Korea, China and Taiwan had similar and even more rapid changes in mortality and fertility.

It may be an important lesson to note that these are not wild assumptions either for a small community or for a very large nation. They reflect what can be done when a government (or a small community) is committed to, and effective in, delivering primary health care and family planning services to its people. It also shows what is happening in so many countries today, where primary health care does not reach most of the people, especially the rural poor.

When we have made the basic assumptions of mortality and fertility declines, the computer program can project numbers of people by age and sex, and numbers of births and deaths for every five-year period for the 50 years 1970–2020. Table C.1 shows just a portion of one of the total population tables. One can see exactly where the decline of fertility overtakes the decline of mortality to bring smaller numbers. In 1990, 20 years after the starting date, Community 2 has 1 person less than Community 1: 3,460 vs. 3,461. From that point, however, the difference becomes very dramatic. By 2000, Community 1 already has 600 more (about 15 percent). By 2010, Community 1 has 1,685, or 38 percent more; and by 2020 Community 1 is 1.7 times as large as Community 2.

One of the basic things these tables can teach is that mortality and fertility are closely related, and that changes in either take some time to have an effect on the total numbers of a population. They do have a more immediate impact on specific age groups of the population. Here are some points worth making:
Table C.1
Projections for total population (five-year periods 1970–2020)

<table>
<thead>
<tr>
<th>Year</th>
<th>Community 1</th>
<th>Community 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Male</td>
</tr>
<tr>
<td>1970</td>
<td>2,100</td>
<td>1,045</td>
</tr>
<tr>
<td>1975</td>
<td>2,360</td>
<td>1,177</td>
</tr>
<tr>
<td>1980</td>
<td>2,663</td>
<td>1,330</td>
</tr>
<tr>
<td>1985</td>
<td>3,024</td>
<td>1,513</td>
</tr>
<tr>
<td>1990</td>
<td>3,461</td>
<td>1,731</td>
</tr>
<tr>
<td>1995</td>
<td>3,996</td>
<td>1,998</td>
</tr>
<tr>
<td>2000</td>
<td>4,620</td>
<td>2,309</td>
</tr>
<tr>
<td>2005</td>
<td>5,338</td>
<td>2,668</td>
</tr>
<tr>
<td>2010</td>
<td>6,184</td>
<td>3,093</td>
</tr>
<tr>
<td>2015</td>
<td>7,176</td>
<td>3,592</td>
</tr>
<tr>
<td>2020</td>
<td>8,277</td>
<td>4,146</td>
</tr>
</tbody>
</table>

- **Fertility and mortality are linked.** High fertility also brings high mortality. High fertility implies that women bear early, often and/or late in their reproductive lives, and all three are known to contribute to high death rates among women and children. This is especially true for the poor. When we reduce fertility, especially by increasing the age at first birth (above 20) and the interval between births (more than two years), we get lower levels of infant and maternal mortality.

- **Population has a momentum.** The people who will give birth to the next generation, for the next 45 years, are already born. Thus even a rapid decline in fertility will not show up in reduced total population, in the case of our examples, for 25 years. Perhaps this is one of the most important lessons we can learn. By the time population-induced environmental degradation is experienced, there is still a ‘built-in’ population growth for the next generation.

- **The impact on age groups differs.** The numbers of small children and infants, ages 0 to 4, who are dependent and need nurturing and good health care, will begin to decline within five years of fertility decline. As the number of infants declines, the differences between the two communities grows very rapidly. Within just 25 years (1995 in the chart) the community without the fertility decline will have twice as many of these dependent infants and children as the community with rapid fertility decline. In 50 years they will have three times as many. For ages 15–19, the ages when children become adults, the differences do not appear for 25 years after the beginning of the fertility decline. By 35 years, however, there is a marked difference, and in 50 years, the larger community will have almost three times as many young adults for whom it will have to find education, jobs or land.

**Resource: Demproj demographic projection software**

One very useful program for projecting populations is called Demproj, for Demographic Projection Model. It is a full-featured population projection program developed by the Futures Group International with partial support from the US Agency for International Development. The program runs on DOS, and requires...
only 770K of disk space and 640K RAM. This is well within the range of most computers today, even light-weight laptops.

The strongest feature of the program is its ease of use. It requires relatively little initial input of data, gives clear choices in different types of assumptions and can produce output either in tables or in graphs. It does this in part because it is linked to a number of basic life tables, from which it computes very quickly the implications of the base population and whatever changes in assumptions (about death and birth rates, migration or AIDS) the user makes.

Requests for copies of the program or more information should be sent to:

The Futures Group International
80 Glastonbury Boulevard
Glastonbury, CT 06033
USA
Tel. +1-203-633 3501
Fax. +1-203-657 9701
E-mail: j.stover@tfgi.com

The cost is US$25.00 for manual and diskette (in 1997). The package is free to some users in developing countries.
C.2 Using a computer for map-making and GIS

Upon completion of the mapping exercise described in Chapter 4, it may be useful to transfer the paper maps on to a computer mapping or geographic information system (GIS) software package. Both computer mapping and GIS packages allow the user to create digital maps that can easily be updated, changed or manipulated. Another common feature of most mapping and GIS software packages is that point, line and area features (e.g., water courses and wetlands, farmer’s fields, locations of wells, roads, houses and buildings and other infrastructure) can be stored in separate layers or coverages for easy creation and updating. The layers can then be added together to create a composite map that shows only the desired features, and is not cluttered with irrelevant information. Figure C.1 provides an example of a ‘manual’ GIS using acetate sheets for overlays on a standard topographic sheet. Data from such a manual overlay exercise can easily be digitized into ‘layers’ or ‘coverages’ for use in an automated mapping or GIS program.

GIS software packages perform many of the functions of a computer mapping program, but also allow the user to create a database of geographic features and to perform spatial analyses of varying degrees of complexity (depending on the sophistication of the package). The database might contain information such as the size of farmers’ fields, the number of residents in each household, the literacy level of different villages or the straight line distance between points on the map. More detailed information on natural resources – such as forest cover, soil erosion data, presence of specific habitats or species or risk of flooding – can also be stored and shown. Even management data, such as the classification of forests by management regimes or the presence in a village of a management committee, can be mapped, allowing interesting overlays between socio-demographic, environmental and ‘action-oriented’ data.

An example of a sophisticated overlay analysis is presented in Figure C.2 (note: the map is reproduced here in one color from a full-color original; the key is therefore illegible). The map, which presents the threats to biological diversity in the Sierra Nevada de Santa Marta of Colombia, synthesizes an array of data on population distribution (including types of settlements – indigenous, campesino or large land holders – and the land uses associated with each type), roads and infrastructure, hydrology and the concentration and distribution of biodiversity. Such a map offers an immediate guide to setting priorities and scheduling action.

Spatial analysis functions such as overlay analysis (identifying the area in which there is overlap between two features), trend-surface analysis (displaying highs and lows of a particular variable as a ‘draped’ surface) or analyses of spatial variability (the degree to which there is clustering or dispersion of a map feature) are common features of GIS. The most sophisticated GIS packages require the computing power of a UNIX workstation and can perform hundreds of spatial and data analysis tasks. Simpler packages can run on a basic laptop computer. Thus, GIS has become a valuable tool for natural resource management as well as for a multiplicity of regional planning and location-analysis applications.

Although it may be beyond the financial means of most field-based PAR exercises, global positioning system (GPS) units can be used to produce highly accurate maps that show exact locations of specific features. GPS units send signals up to satellites that orbit the earth and, through triangulation, are able to define within 50–100 meters (depending on the unit’s accuracy) the latitude and longitude of a point on the ground. This can be particularly useful in work with local groups such as indigenous peoples who need, for political reasons, to accurately define their territory (see Poole, 1995).
Computer-generated maps may be particularly useful in communicating the results of a participatory appraisal to decision-makers in government institutions, as they are clean and easy to read, and may be perceived (rightly or wrongly) as ‘more valid’ than hand-drawn maps.

**Resource: Map Maker for Windows**

Map Maker is a simple geographical information system (GIS) designed to allow non-expert users to create and manipulate maps. Using a variety of tools you can navigate around the map, measure distances and areas, draw polygons, lines and symbols, and display and edit data. Graphic objects on the map may be related to information in a data base, and data bases may be created directly from the map. You can print maps directly on to any printer or plotter fully supported by Windows 3.1 or 95, and you can produce images for inclusion in documents produced using Windows-based word processors.

The Map Maker project is designed to promote the wider use of maps as management tools, primarily in developing countries. This IBM-compatible Windows-based software is available free to non-profit-making institutions, students, and academics. The software has largely been developed in the field in collaboration with several institutions, in particular IUCN – The World Conservation Union, the Centro Agronomico Tropical del Investigacion y Ensenanza (CATIE), and the Asia Desk of the United Nations Center for Human Settlements (UNCHS). There are currently registered users in 110 countries.

*For organizations or individuals in developing countries, Map Maker can be obtained free of charge. Those who have sufficient resources are encouraged to make a contribution of $50. For more information, or to obtain the Map Maker program and documentation, send a request to:*

**Eric Dudley**  
64 Tenison Road  
Cambridge, CB1 2DW  
UK  
Fax: +44 1223 350349  
E-mail: eric@mapmaker.com

*For users with more advanced mapping needs there is an enhanced commercial version of the software available called Map Maker Pro 2.0.*
Figure C.1

Manual geographic information system
(planning forest management initiatives in India)

From: Poffenberger et al., 1995
Overlay analysis produced using a sophisticated geographic information system (threatened areas by watershed in Colombia)
References and suggestions for further reading

The books, reports, manuals, articles and journals listed below were helpful in the writing of this handbook. Documents with a three-letter key in the right column are particularly valuable resources for the following:

*methods and tools for participatory action research*: PAR

*primary environmental care*: PEC

*population and the environment*: P&E


Ascher, W., *Communities and Sustainable Forestry in Developing Countries*, Institute for Contemporary Studies, San Francisco, 1995.


Borrini-Feyerabend, G., *Collaborative Management of Protected Areas: Tailoring the Approach to the Context*, IUCN, Gland (Switzerland), 1996.


Fundación Pro-Sierra Nevada de Santa Marta, *Estrategia de Conservación de la Sierra Nevada de Santa Marta*, Bogota, Colombia, 1997.


IASCP, *The Common Property Resource Digest*, Yale University, School of Forestry and Environmental Studies, New Haven (Connecticut).

PEC


*ILEIA Newsletter*, Centre for Research and Information Exchange in Ecologically Sound Agriculture, Leusden (Netherlands).


PAR

International Development Program (Clark University), National Environment Program (Government of Kenya), Egerton University and World Resources Institute, *Participatory Rural Appraisal Handbook*, World Resources Institute, New York, 1992.

PEC


PEC


PAR


PEC


PAR


P&E


Lewis, C., Managing Conflicts in Protected Areas, IUCN, Gland (Switzerland), 1996.


Pimbert, M., "Training workshop on joint forest management, West Bengal, India", manuscript, WWF, Gland (Switzerland), 1994.


*PLA (Participatory Learning and Action) Notes*, IIED, London.


PAR

PEC

PRB

PEC

PAR

PEC

PAR


PEC


PAR


Scott, P., *From Conflict to Collaboration: Mount Elgon Case Study*, Issues in Forest Conservation series, IUCN/WWF, Gland (Switzerland), 1996.

PAR


PAR


PAR


PAR


Yaro, Y., “Migrations internes et gestion traditionnelle des terroirs au Burkina”, manuscript prepared at the request of the IUCN Social Policy Group, Gland (Switzerland), 1995.

About the authors

Thomas Barton is a medical doctor and anthropologist who has been involved in community participation and community organization for almost 30 years. He is an eclectic, problem-solver pragmatist, firmly committed to a belief that people working together can make their lives more satisfying and their surroundings a better place to be. Currently, he is a partner in the Creative Research and Evaluation Centre (CRC), a consulting firm in participatory methods based in Kampala, Uganda, and working widely in Africa.

Grazia Borrini-Feyerabend holds a doctorate in physics and a masters in public health. Her interests lie mostly with processes of local organizing and partnership development in the areas of health, population dynamics and natural resource management. She is currently the head of the IUCN Social Policy Group. Her experience includes research, training, policy development and writing in public health and sustainable development (primary environmental care). She has had the opportunity to work with people of many cultures.

Alex de Sherbinin holds a masters degree in geography with a specialization in population-environment interactions. He is currently a University of Michigan Population-Environment Fellow with the IUCN Social Policy Group. Previously he worked as a population geographer with the Population Reference Bureau in Washington, DC, and as an agricultural extension agent with the Peace Corps in Mauritania, West Africa.

Patrizio Warren is a development anthropologist. He carried out extensive field-research on the medical system and the human ecology of the Shuar-Achuar people of the Peruvian and Ecuadorian Amazon. He has also collaborated in participatory action research and training projects in Latin America, Africa and Asia. Currently, he works as a consultant on participatory methods for the Forestry Department of the United Nation’s Food and Agriculture Organization (FAO).
This handbook illustrates concepts, methods and tools for primary environmental care, an approach that seeks to empower communities to meet basic needs while protecting the environment. In particular, it focuses on how population size, structure, growth (or decline) and movements relate to the quality of the environment and the quality of life. Emphasis is placed on a community-led process of participatory action research in which local knowledge and skills are fully utilized. The main purpose is to promote the effective, integrated management of environment and population dynamics for the benefit of local people in rural communities.