

5

Policies and strategies for sustainable development

The sustainable livelihoods framework expresses the fact that *policies, processes, and structures* are of key importance if people are to be able to generate various forms of capital, and also that they are central in creating opportunities for alternative *livelihood strategies* (see chapter 3). Policy processes can be seen as mediating between various capitals, including human capacities and environmental resources, and what poor and vulnerable people can actually do and achieve. This mediation happens through governments, private enterprises, and civil society, which (for example) together determine how markets operate. They all develop policies and strategies of various kinds in order to enable their programmes to become more effective, more efficient, and more closely aligned to stated objectives and policies, for example in terms of environmental care. Of course, the three realms of government, the private sector, and civil society overlap and interact. Governments may run or own companies; various interest groups are represented in government and may take part in State administration and policy making; and companies may supply services that are usually expected of government, or they fund political parties and charities. Furthermore, the way in which they interact depends strongly on the political system and on relationships within any particular country.

The distinction between policies and strategies for development is not clear-cut. Usually policies articulate both aims (what to achieve) and means (how the aims are expected to be achieved), but the latter only in the most general terms. Governments at various levels make public policy, which includes plans for legislation and all kinds of actions and services. Strategies (of government, businesses, or charities) are more practical than policies; they consider the capacities and comparative weaknesses and strengths of the various parties involved (the stakeholders). Nevertheless, strategies still do not provide the detail of *what to do* and *how to* achieve goals: they provide the general outline for a certain course of action.

There is a plethora of management tools for the formulation and implementation of policies that are geared towards sustainable development. Section 5.1 presents some general policy aims and strategic tools and approaches that help governments, NGOs, and others to determine their own direction. Some examples of indicators for monitoring sustainable development are also given.

Section 5.2 discusses some important national but still 'macro-level' environmental issues, and the policy-processes that limit or enhance environmental and livelihood changes. There is a clear trend among national and international development NGOs and their local partners, i.e. citizens' groups, towards strengthening campaigns and doing more lobbying of governments and international agencies for policy changes, and towards challenging the activities of transnational companies (TNCs). Section 5.3 discusses international campaigns and lobbying, including those with implications for global trade and food security. Sections 5.2 and 5.3 present examples of actual policies and policy-making processes at national and international levels.

5.1 Planning for sustainable development

This section highlights some general policy aims and strategic tools and approaches that enable governments, NGOs, and others to draw up their strategies for the medium to long term. It is impossible to consider the detail of the environmental policies of the governments of individual countries – how policies are agreed and implemented – but some general strategy-making processes are explained. This section also discusses some indicators that show progress towards policy goals in the realms of sustainable development.

5.1.1 Environmental policies and strategies of governments

Policy instruments

The policy instruments that governments have at their disposal to achieve some degree of sustainable development include the following (see also section 2.2.4).

1. *Regulation*, for example through laws and bylaws that forbid certain chemicals to be used, and set environmental standards and maximum limits for pollution. Laws can also demand certain procedures to be applied, such as Environmental Impact Assessment (EIA – see chapter 4) in the case of large and potentially harmful developments.

2. *Market-based instruments*, in particular taxation and subsidisation. These can include subsidies for the development of environment-benign technologies such as sustainable agriculture, tariffs to limit the importation and use of particular chemicals, and taxes on pollution, deforestation, mining, and other environmental externalities. Tariffs and resource-taxes thus act as disincentives: they discourage what is unwanted, and they provide a signal to markets to develop alternatives, in particular when they become the main source of revenue for government. They are in fact an alternative to income-tax or taxes on trade in locally grown food products, which discourage the development of livelihoods and employment opportunities, and give local people no incentive to maintain environmental resources.
3. *Public campaigns* that help to create awareness among citizens and enterprises of the environmental impacts of their behaviour.
4. Governments can also *invest* themselves, for example in the regeneration of mangrove forests, the clean-up of polluted waters and land, infrastructure to protect human settlements from landslides, or the protection of steep mountain slopes.
5. Many governments consider making claims through invoking the principle that *the polluter pays* in cases of industrial contamination, even when the pollution took place at a time when no anti-pollution laws existed, or when standards were different. This is obviously rather less attractive to governments if they were the historical owner of the industries, as is the case in many developing countries.

National environmental policy documents

Most developing countries and all industrialised ones have produced documents with National Environmental Management Action Plans (NEAPs or NEMAPs), National Conservation Strategies (NCSs), and/or National Strategies for Sustainable Development (NSSDs). This is often done with the financial and technical support of bilateral and multilateral agencies such as the World Bank and the regional Development Banks, UNEP, UNDP, bilateral donors, and also the IUCN and WWF.¹ The NCSs are promoted particularly by the IUCN; they aim to analyse the possibilities for integrating pro-conservation conditions into the economic development process. The World Bank promotes NEMAPs and has supported many low-income countries in developing them; many examples are available through the Bank's publications department and website. In NEMAPs, environmental problems and mitigating policies are formulated with the aim of mainstreaming environmental management in national decision making.

NSSDs relate to the implementation of Agenda 21, the main document agreed at UNCED in 1992 (see also section 2.1.2 and Appendix 1). They integrate environmental, economic, and social objectives into national policy making. There is now international agreement that by 2005 all countries will have begun implementing their own NSSDs. The UN Commission on Sustainable Development (CSD) sees them as particularly important for national capacity building, and a key step towards meeting the international development target of reversing the degradation of environmental resources at national and international levels by the year 2015. NSSDs should be regarded as complementary to other national strategy and planning documents, and they should ensure that ideas about environmental sustainability are fully integrated into mainstream policy. It is felt that NSSDs should be developed in wide consultation with officials, experts, and ordinary citizens, that implementation should happen at all levels (from the national to the local), and that local capacity building is essential.

Government strategies are informed by national statistics, with data coming from a range of departments, research institutes, and universities, and often also from research and documentation carried out by international agencies (see Appendix 2 for sources of data, including websites). Much of the data and documents that support policy development are descriptive and inform NSSDs and the like; they are not necessarily a reflection of political compromise and agreed policy, since they are generally compiled by experts who are somewhat removed from policy making. Nevertheless, they are often extremely informative – and the information can prove very powerful, if interpreted correctly and used at the right time. Environmental Profiles, for example, available for many countries, are generally descriptive, and indeed informative, since they tend to give a brief but complete overview of important environmental issues, policies, and organisations, as suggested in Table 5.1. The integration of environmental considerations into national strategies, as outlined in the table, is important, because it provides a framework for development in a range of areas. In fact, the national strategies as such can also be seen as national policy, depending on the political status that they are given.

Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) has been described as a process to aid the integration of environmental considerations into specific (sector) policies, laws, plans, and programmes, 'on par with economic and social considerations'.² This tool should lead to more concrete results than the various national strategies or general policies can provide, yet SEA does not operate at project level. It nevertheless seems to have grown out of decades of experience with Environmental Impact Assessment, which is a project-management tool (EIA; see chapter 4). SEA is a fairly recent development and

Table 5.1: Environmental Profile: sample outline³

| | |
|--|---|
| Introduction | Objectives of the Profile, which may include (a) to identify recently developed environmental management processes and management knowledge; (b) to identify resource use and resource management; (c) to assist planning to reverse environmental degradation and work towards sustainable development; (d) to develop and strengthen monitoring and evaluating environmental impacts; (e) to inform debates on the relationship between poverty and environment. This section should also include the status of the document in the department or organisation and decision-making processes. |
| Description of environmental issues | Environmental changes and their impact on social changes, for example changes in agro-ecosystems, habitats, demography and urbanisation, health, water quality and quantity, land and soil degradation, deforestation, fisheries, marine resources, water for agriculture, agro-chemicals, wildlife, energy, mining, and urban and industrial pollution. |
| Environmental policies | Past, present, and future policies of the government, political parties, NGOs, and donor agencies, including legislation, regulation, and responsibilities. |
| Institutions and organisations | Capacities of groups (in the particular region or country and internationally) which deal with environmental issues: environmental action groups, information centres, research and training institutes; and the actual and potential co-operation between them. |
| Recommendations | Concrete suggestions for planning, monitoring, and evaluation of environmental impacts, setting up or strengthening of relevant institutional structures and future policies. |
| References | Sources of information used for the profile, and bibliography for further consultation. |

is so far not being applied by many developing-country governments. However, SEA does appear to be useful, and a number of industrialised countries have developed legislation and institutional arrangements for it, while development agencies such as the World Bank have initiated sectoral and regional (strategic) environmental assessment. Some guidelines now exist, and the literature is developing.

The steps to be taken in the SEA process are very similar to those of EIA, yet characteristics differ, as outlined below.

Steps in Strategic Environmental Assessment⁴

Screening

Assess which strategic decisions may have significant environmental consequences.

Scoping

Research and provide information in order to judge (a) whether an initiative (policy, plan, or programme) should proceed, and (b) whether alternative approaches may be better for the environment. Sufficient environmental and socio-economic information must be generated; the assessment must be timely; it must involve consultation of stakeholders; and it must set out mechanisms of accountability. Analysis of the wider social-environmental context and environmental problems and opportunities must include current trends, environmental norms and standards, and the capacities of various social actors.

Decision-taking

Actual decisions are taken following analysis of the implications for environmental sustainability of policies, laws, programmes, and their alternatives.

Action plan for enhancing sustainable development

This must include details of proposals for the programme, policy, or law and must show how these are expected to support environmentally sustainable development.

Post-decision

Information on the actual impact of the decisions, policies, laws, or programmes is collected for further learning and possible changes.

Table 5.2: A comparison of Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA)⁵

| SEA | EIA |
|---|--|
| Is proactive and informs development proposals | Usually reacts to a development proposal |
| Assesses the effect of a policy, plan, or programme on the environment, or the effect of the environment on development needs and opportunities | Assesses the effect of a proposed development on the environment |
| Addresses areas, regions, or sectors of development | Addresses a specific project |
| Is a continuing process aimed at providing information at the right time | Has a well-defined beginning and end |
| Assesses cumulative impacts and identifies implications and issues for sustainable development | Assesses direct impacts and benefits |
| Focuses on maintaining a chosen level of environmental quality | Focuses on the mitigation of (negative) impacts |
| Has a wide perspective and a low level of detail, to provide a vision and overall framework | Has a narrow perspective and a high level of detail |
| Creates a framework against which (negative) impacts and benefits can be measured | Focuses on project specific impacts |

In both SEA and EIA, national regulations and practice determine the rights of citizens to participate in the actual process of assessment and decision making, or to be informed about the outputs of these processes, i.e. the detailed information that is produced. Civil-society organisations vary in terms of their ability to exercise those rights effectively.

Specific laws and programmes that thus fill in the details of national strategies for conservation or sustainable development and that are developed with the aid of SEA may still not stipulate environmental standards. Standards of maximum permitted pollution or otherwise can be enshrined in law, but they are generally at a further level of detail, and they may have to change from

time to time on the basis of new scientific findings. It is generally within the powers of, for example, the national Ministry of Environment to set standards, but it does not necessarily have the capacity to enforce them.

5.1.2 Environmental policies and strategic plans of development organisations

Few development NGOs have detailed policies on environmental sustainability, although most subscribe to some interpretation of sustainable (human) development, be they local or international NGOs.⁶ Reasons for this include a limited internal capacity for addressing what is not always seen as central to the organisational mandate, which may be 'to eliminate poverty', or 'to reduce human suffering'. There is often limited understanding of the interaction between social change and environmental change. Development NGOs have fewer links to the world of environmental campaigners than some might have expected, following the positive dialogues at the UN Conference on Environment and Development (UNCED) in 1992 (where a Global Forum was organised, dominated by NGOs – see section 2.1.2). UNCED was about environment *and* development. Even so, it is acknowledged by many in development circles that such links are valuable, if only for the 'opportunities' that cases of extreme environmental degradation 'offer' for addressing poverty issues.

The main policies and medium-term strategic plans of development organisations usually include some reference to sustainable development and environment. Oxfam's overall strategic aims include 'achieving sustainable livelihoods'.⁷ Under this broad 'umbrella', several strategic aims are formulated, most notably to improve income, employment opportunities, and food security, while improving or maintaining social equity and environmental sustainability. These aims then translate into strategies and a practical approach to development that makes use of various analytical and participatory tools, as it does in several programmes of the international NGO CARE, and also UNDP and DFID.⁸

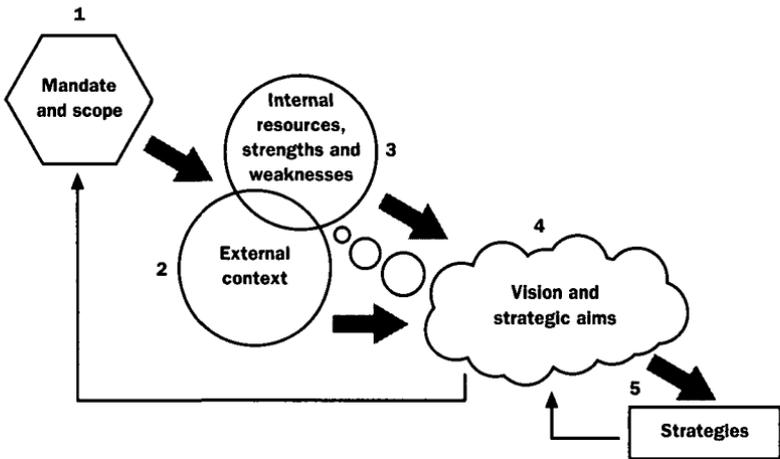
The strategies of NGOs consist of projects and campaigning efforts to promote or challenge policies that affect livelihoods and environments. For example, many development NGOs promote forms of sustainable, low-external-input agriculture in support of poor subsistence farmers and commercial smallholders.⁹ Another example is Oxfam's analysis of the causes of global poverty and links between (mostly Northern) consumption and (mostly Southern) poverty, in preparation for a large-scale international campaign. The key document for that campaign, *The Oxfam Poverty Report*, contains a chapter on ecological footprints.¹⁰ The idea here is that global environmental change such as climate change or the use of rainforests by international logging

companies is largely driven by the consumption demands of affluent peoples. Thus sea-level rises, increased river flooding, and the depletion of fish stocks can be seen as primarily caused by the 'ecological footprint' of high-consumers. These consumption patterns are maintained and stimulated by international economic policies, including trade regulations. Since poor nations and vulnerable groups of people are the first to suffer from these environmental changes, a programme to alleviate poverty must logically include a campaign against unsustainable resource consumption by the better-off.¹¹

International aid agencies require strategy documents in their country programmes, and these strategies need to comply with the laws and policies of the governments with which they work. NGOs may work primarily with certain elements of civil society, but they too are generally expected to work within the government's policy and legal frameworks. UNDP's multi-year planning instrument for technical co-operation with a country is called 'Country Programme': a document that spans five years and supports a portfolio of projects. The UK's Department for International Development (DFID) produces Country Strategy Papers over three-year cycles, defining a medium-term development strategy in and with the country concerned. In Oxfam GB, Strategic (Business) Plans exist for country programmes, regional programmes (i.e. several country programmes combined), and the entire international programme.¹² Most international NGOs have similar planning systems, and many of their national counterpart organisations have adopted medium- to long-term planning procedures too.

These plans help individual organisations to take decisions about (for example) allocating grants, recruiting and training staff, and various development activities. 'Activities' can be in geographical areas or in particular sectors of the economy; they may be projects involving particular groups of people, or they may be campaigns for changes in public policy. The plans usually set out a contextual analysis and formulate medium- to long-term aims and activities; they may cover a period of three–five years. The process of medium-term strategic planning is expressed in Figure 5.1.

In **Step 1** of this process, an analysis is made of what the organisation or country programme is expected to do, or not, in accordance with internal policies and regulations, legislation, and the requirements of the main stakeholders (including donors, beneficiaries, citizens' groups, and possibly trustees of the charity concerned). An NGO's country or regional programme is bound by what directors and trustees have agreed as the organisation's mission statement, and bilateral aid programmes are expected to take heed of the general policies of both the host and the donor government. The mandate of the organisation or programme and the scope of strategic planning are thus bound by what is 'given' and is not negotiable.

Figure 5.1: Developing strategic, medium-term plans

Step 2 concerns analysis of what is called *vulnerability context* in the sustainable livelihoods framework: possibly trends in the wider organisation and also in other organisations, plus analysis of what poor people and governments are doing to address poverty and manage environments. In this step, national policies must be analysed, and the capacities and limitations of (potential) counterpart organisations. The needs of poor and excluded women and men to which the organisation could possibly respond will relate to the various ‘capitals’ in the sustainable livelihoods framework and to (national) policies and structures of governance: these together enable people to pursue their livelihood strategies.

Step 3 focuses on what is possible, depending on internal financial and human resources, strengths and weaknesses. It involves a review of the existing programme or portfolio of projects. The second and third steps interact strongly.

In **Step 4** a distinction is made between a vision (what the organisation or country programme wants to contribute towards, together with many others), leading to a so-called mission statement, and the programme’s strategic aims. The latter highlight what is really fundamental to change in a given society, and what can be changed – although not usually in the short term. They express what is *possible* to change and what is prioritised, given the organisation’s capacities, experience, and resource limitations. Strategic aims are likely to identify a focus on geographical areas, particular social groups, types of livelihoods, and environmental issues.

Strategies are the way to achieve the aims; they are formulated in some detail in **Step 5**. They are normally accompanied by a budget outline. Strategies must also include an indication of partnerships that are important, plus information on institutional learning, the strengthening of internal capacities, and the capacities of counterparts.

It needs to be stressed that these steps are not entirely chronological, and indeed the diagram indicates that certain iterations are expected to take place during this planning. It could even be argued that, as with analysis following the sustainable livelihoods framework, an analysis and planning exercise needs to start with desired outcomes, i.e. changes in livelihoods and environments, and then work 'backwards', in order to identify the obstacles that are strategically the most important and the most amenable to change.

The strategic planning guidelines of Oxfam GB contain guidance on the meaning of sustainable livelihoods and the relevance of this framework for some of the steps of the strategic planning process.

Oxfam GB: strategic plans and sustainable livelihoods¹³

For Step 1: Mandate and scope

Country and regional programmes should follow the organisation's mandate, general policies, and strategic choices, which have included working towards sustainable livelihoods for several years now, as one key interpretation of 'working towards overcoming poverty and suffering'. One of Oxfam's core aims is to support people in asserting 'the right to a sustainable livelihood', with two key outcomes: (1) 'increased food and income security for primary producers, landless and urban dwellers, who live in poverty', and (2) strengthened 'access of poor people to secure paid employment, labour rights, and improved working conditions'.¹⁴ Also articulated is the need for social equity and environmental sustainability (with the rights of future generations particularly in mind).

For Step 2: External context

Analysis of the causes of poverty, environmental change, and livelihood needs should include an assessment of the overall trends in environmental and market-related factors (*vulnerability context*). For particular social groups, analysis should determine their capacities (for example health, knowledge, and strengths of social networks) and identify the trends in their claims and relative control over assets (that is, *social* and *human capital*), and the quality of environmental resources (that is, *physical* and *natural capital*). It is important to understand which livelihoods prevail in

the region or social group concerned, and people's ability to offset risks and cope with shocks in climates, markets, and so on. Furthermore, the main 'macro' *policies and processes* that affect them need to be understood. The capacities of partner organisations with regard to supporting livelihoods and environmental sustainability need to be assessed.

For Step 3: Internal resources, strengths, and weaknesses

Determine which internal resources, strengths, and weaknesses exist in terms of understanding and supporting livelihood strategies of particular groups of people, and influencing *policies, processes, and structures* that affect the environmental sustainability of livelihoods.

For Step 4: Strategic aims

Strategic aims can be formulated in basic terms, such as 'improve food security' or 'support the livelihood of ...', and they can also be formulated as 'alternatives'. For example, 'support the development of livelihoods of smallholder farmers who produce organic coffee and who market this through fair-trade channels'. Strategic aims may focus on a particular type of livelihood or commodity, and will also express a focus on *capitals*, on *policies*, or a mix of the two. Strategic aims, alternatives, and indicators for success in improving livelihood sustainability must follow from close consultation with the people concerned.

For Step 5: Strategies

Strategies are normally composed of a range of approaches that operate at various levels, and they articulate intermediate objectives, i.e. changes in particular policies of governments, improvements in the practice of counterpart organisations, or immediate improvements in the survival chances of victims of disasters. The approaches include practical emergency-relief responses, rehabilitation efforts after a crisis, capacity building of partner organisations or grassroots groups, networking with other organisations, and also campaigning at national and international levels – all of which are expected to work towards a common, strategic aim. Alternative livelihood strategies are based on changes in policies, markets, technologies, and other social and human capacities.

Thus a range of strategies is formulated that all work towards the same aim, for example the aim of supporting the sustainability of livelihoods of the poorer women-headed households in a particular region. In this example, strategies could include local campaigning to strengthen women's legal rights and improve their actual control of land; development of the technological and managerial capacities of women

members of farmers' groups; and international lobbying to limit the control of international companies over (local) genetic resources. Campaigns should aim to prevent smallholder farmers becoming dependent on companies for acquiring seeds, which is particularly risky for women-headed households with very low cash incomes. Successful implementation of such strategies depends on good partnerships with developmental and environmental organisations and activists.

Strategic planning is essentially an internal process for organisations, but various stakeholders are consulted at several stages of the process described above. The strategies expressed in these plans involve a number of stakeholders or social actors, and should in principle be agreed with them. Of central importance in formulating strategies is identifying the relative strengths and weaknesses and the comparative advantages of organisations, in terms of particular livelihood and environmental problems and opportunities. A good strategy thus articulates collaboration, partnerships, and networking. About many development NGOs it is fair to say that until now they have rarely had strong links with environmental activists and movements in the developing world, and that these links need to be strengthened.

Strategic plans need to include a clear articulation of rights to environmental resources, which are a key necessity for livelihood security, in particular land in rural areas and housing in urban areas. Rights to those resources are usually different for women and men, both their respective legal rights and their actual access to the resources. These rights are essential for livelihood security, especially for the most deprived, which tend to include women-headed households, and they are also key to achieving better environmental management.

Strategic plans are also expected to conceptualise the links between national policy and local environmental management. In Oxfam's programme in the Philippines, for example, strategic plans of the last decade or so have expressed a combination of practical regeneration of fishing grounds by grassroots groups, support from intermediary NGOs for fisherpeople's organisations, and national networking and campaigns on fishing rights. These various actors and activities were partly funded, and also supported in other ways, by international organisations. All share the goal of supporting poor fisherfolks' livelihoods and the natural resources on which they depend – with some success: synergy has been achieved between a range of activities in working towards those twin goals.¹⁵ However, despite attempts to work towards improvements in livelihoods as well as in the status of both women and men, fishing is primarily a male domain, and women have benefited mainly indirectly through improved household income security.

In Oxfam's Vietnam programme, support in the northern province of Lao Cai and specifically in the commune Lung Vai for the implementation of land-reform legislation has stimulated farmers to plant trees and helped to reduce a local form of 'slash and burn' cultivation (this case history is discussed in detail in section 3.1). Oxfam's experience of supporting land-tenure claims at the local level led to engagement with provincial and national authorities and contributed to a country-wide shift in the implementation of land-tenure policy. This is expected to be a gain for women in particular, because their names are now included in Land Use Certificates. In Kenya, following a review of support for nine grassroots NGOs working in conservation farming, Oxfam and partners planned to strengthen their policy analysis and national influencing capacity, which indeed began happening with a particular focus on international trade and also land-tenure policies.¹⁶ However, national and regional development programmes still make few links between national policies, global (international) environmental change, local poverty, and local environmental change, even though the importance of national policies is generally acknowledged.

To influence policy, good knowledge of the environmental specifics is needed. The UNDP develops five-year country programmes through a similar internal planning process. In Step 2 of the strategic planning process (see above), they propose the drafting of an 'Environmental Overview of the Country Programme (EOC)' (which is in fact an example of Strategic Environmental Assessment and shows strong similarities to Environmental Profiles – see section 5.1.1.) In outline, EOCs are expected to cover the following factors.¹⁷

UNDP – Environmental Overview for Country Programme

a. Brief description of the natural environment of the country

This section provides basic physical characteristics with a focus on the most important environmental resources (including mineral resources that can be mined) and phenomena (for example, regular drought and flooding). It should present environmental baseline data and some detailed information on land, water, non-renewable resources, and biodiversity issues.

b. Main environmental issues

Here the five most important environmental issues of the country are described in more detail, for example air pollution, potential for recycling of waste, water-treatment infrastructure, and so on.

c. Economic development and the environment

In this section the environmental implications of national planning, economic policies, and regulations are discussed.

d. Ability of the country to achieve environmentally sustainable development

In this section are discussed the existing environmental policies, laws, and regulations, the main environmental actors (including international agencies), environmental education and awareness, and institutional issues pertaining to environmental management.

e. Identification of environmental impacts associated with the programme

The potential impacts should take into consideration alternatives proposed by the programme.

(Total length should not exceed 10 pages)

5.1.3 Indicators of sustainable development

As in logical frameworks (a project-management tool; see chapter 4), central features of strategic plans are indicators of success in achieving aims – indeed, a reason for developing medium-term plans in the first place is to enable organisations and regional or country programmes to monitor change and assess their impacts.

The sustainable livelihoods framework suggests some general livelihood outcomes that would indicate people's success in pursuing their livelihood strategies (see section 3.2, and also section 4.3.2 on livelihood outcomes and impact indicators). Impacts of national or regional development programmes on successful improvements are difficult to determine, because they are just one 'actor' among many, and indeed development organisations pay due attention to partnerships in their strategy formulation. Nevertheless, strategic plans need to suggest indicators that show general and lasting change and that at the same time make some causal link to the activities of one or more social actors. Indicators of change or impact of strategic programmes are thus very similar to 'livelihood outcome', but must be formulated in more detail for a particular situation than is possible with the framework.

Nevertheless, categories of change or outcome indicators can be useful. Desired changes in environmental resources can include (for example) 'more access to safe drinking water'; 'more renewable environmental resources

available'; and 'reduced resource degradation'. Other indicators express the notion of access and control to resources and the outcomes that are more directly related to livelihoods, including 'stronger women's rights and control over land' and 'less malnutrition'. Literature provides very large numbers of indicators of sustainability or of sustainable development (see also section 3.1), most of which are very similar to livelihood outcomes. Furthermore, some desired changes relate to *policies, processes, and structures*, and the various capitals in the sustainable livelihoods framework.¹⁸ The synopsis in Table 5.3 categorises indicators of sustainable development per main group of the framework. (No indicators are listed for *vulnerability context*. Some of the trends and hazards under *vulnerability context* are caused by human action and can be improved with certain policies; but it is generally very difficult in the short to medium term to make any confident claim for improvements following policy change, even if the improvement itself can be asserted.)

Table 5.3: The sustainable livelihoods framework and categories of indicators of sustainable development

| The sustainable livelihoods framework | Examples of indicators of (national or regional) sustainable development:¹⁹ change, and possibly impact |
|--|--|
| <p><i>Livelihood outcomes</i></p> <ul style="list-style-type: none"> • More income • Increased well-being • Reduced vulnerability • Improved food security • Improved social equity • Improved sustainability of environmental resources • Non-use values of nature secured | <ul style="list-style-type: none"> • Improved human-development index, which is made up of factors expressing income, life expectancy, and access to education, etc. (UNDP, 1998, 1999). • Increased per capita income (GNP per capita) or per capita purchasing power; reduced income poverty. • Improved employment opportunities and reduced unemployment rates; creation of new jobs. • Diversifying national economies. • More equitable distribution among social groups of costs and benefits of nature conservation. • Reduced incidence of disease and death from environmental vectors and pollution. • Improved industrial-safety measures and reduced industrial accidents. • Genetic diversity of crop varieties and plant species maintained. • Negative effects of mining (including oil exploration) on local livelihoods are reduced or mitigated. • Improved conservation of areas with irreplaceable environmental phenomena. |

Table 5.3: The sustainable livelihoods framework and categories of indicators of sustainable development (continued)

| The sustainable livelihoods framework | Examples of indicators of (national or regional) sustainable development:¹⁹ change, and possibly impact |
|---|--|
| <p><i>Livelihood capitals</i></p> <ul style="list-style-type: none"> • Natural • Physical • Social • Human • Financial | <ul style="list-style-type: none"> • Improved human-development index, which is made up of factors expressing income, life expectancy, and access to education, etc. (UNDP, 1998, 1999). • Per capita natural-resource consumption, for a given standard of living, is dropping. • Natural resources like fish and forest are 'harvested' at or below the rate of their renewal. • Soil fertility maintained from using more local biomass, successful use of practices such as nitrogen fixation and intercropping, or improved nutrient recycling. • Increased proportion of the population has access to clean drinking water and adequate sanitation facilities. • Increased and freer flow of 'clean' technology to developing countries. • Improved national and human capacities regarding 'clean' and 'sustainable' production technologies. • Improved national capacities for environmental monitoring and auditing. • Diversification in livelihood skills and enterprises in communities. |
| <p><i>Policies, processes, and structures</i> (rules and regulations that make up social institutions)</p> <ul style="list-style-type: none"> • Government: laws, regulations, and policies • Private sector: behaviour and markets • Civic and political institutions | <ul style="list-style-type: none"> • Improved laws and procedures to integrate environmental values in policy, planning, and national accounting. • National economic indicators express environmental values and stocks better. • Taxation and tariff systems provide more incentives for 'cleaner' technology and reduced use and degradation of environmental resources. • Subsidisation encourages transfer and development of 'clean' technology. • More effective environmental monitoring and auditing systems. • Improved compliance with internationally agreed environmental practices and standards. • Increased voluntary agreement in sector-associations of business to improve environmental behaviour. • More equal rights of access for women, ethnic groups/castes to resources (land, water, fishing grounds, public infrastructure). • Intensified civic participation of vulnerable people in resource management and allocation. • Increased access to regulated financial services of the poorest 20 per cent of the population. • Fewer conflicts over resource claims. |

5.2 National policies and campaigns for sustainable development

Many national policies and structures contain some environmental element. Conversely, campaigns by civil-society groups for more or better environmental care are rarely purely environmental. They are more likely to be campaigns for access to economic development processes, but on the terms and in the interest of local, excluded people. Environmental degradation is usually one among several reasons for protest, and proposals for alternative paths of (local) development. 'The environment' can thus be seen as one 'entry point' to poverty-related campaigning, which calls for strong links between development NGOs and the local environmental activists and NGOs,²⁰ and also sector ministries and government services with a stake in improving environmental conditions.

This section presents some thematically grouped examples of national environmental policies and local campaigns, which in some cases have international dimensions and links to international actors. Several of those themes and examples concern local people's control over land, and issues of compensation for the loss of it. Campaigns are often informed by EIAs (environmental impact assessments), which are now legally required elements of planning processes in most nations of the world (see also chapter 4).

5.2.1 Land and livelihoods

Campaigns for securing access to agricultural land, 'ancestral domain', forests, and pastures are widespread and are among the most important ways to secure the livelihoods of poor and vulnerable women and men. National governments are the main target of campaigners, as they make and implement laws on land ownership, tenure, and use rights, although that often happens in some (informal) arrangement with traditional leaders. The World Bank, bilateral donors, and other international development agencies often play an important role too, as they support research and the development of new legislation.

Land provides for livelihoods, and indeed for cultures, in ways that are as many as there are peoples in the world. Nevertheless there are parallels and lessons to be learned from others. One lesson from Vietnam (see section 3.1) is that help with implementation of land-reform legislation at a very local level, combined with dialogue at national level, can result in altered and indeed improved implementation strategies. However, in many other cases land is contested strongly, ownership patterns cause extreme poverty and deprivation, and the struggle for land can lead to civil war.

Mining and traditional land rights

In **Zambia**, the national copper-mining company ZCCM is the largest landowner apart from the State. People, including retired miners, have lived and earned part of their livelihoods from some of that land for years, often without full awareness of its legal status. The Copperbelt is a comparatively urbanised part of Zambia, where farming and local trade and services usually make up the mix of livelihood strategies for families of miners and ex-miners, in particular with the decline of mining profitability and employment opportunities. Research shows that these people for various reasons do not wish to go back to the remote rural areas from where they migrated decades or so ago. The new Land Act now makes the sale of this land possible, and many people are threatened with eviction from their small plots and homesteads. Many have entered designated forest areas to engage in charcoal burning, and stayed put as farmers after the forests were cleared. They are thus illegal squatters on 'gazetted' land controlled by the Forestry Department. The situation is made more complex because of promises made by politicians that people can stay where they are, or be resettled, and that certain forestlands will be 'de-gazetted' (brought back legally into the private domain, so that they can be controlled and used by individual households or small communities). Legal procedures for acquiring title deeds to what is designated agricultural land (including de-gazetted forest) are complex, expensive, and confused. For example, few officials seem to know that women can have legal title at all, even though under customary law they are not entitled to own property. Local authorities are currently discussing resettlement of people living on ZCCM land, and World Bank money will be forthcoming for 'emergency support' of victims of eviction and also for the increasing numbers of unemployed miners. Much of the forest reserve in this area is now depleted of forest, under threat, or designated for de-gazetting; policing of tree stands has proved not to work. New initiatives are being taken regarding community forestry management on the basis of a new Forestry Act. Oxfam²¹ has initiated a 'livelihoods improvement programme' that attempts to aid thousands of poor farmers to get title to their land, for example through legal support. It engages in national awareness and advocacy programmes in order to address the effects of land privatisation, and also to encourage the implementation of the national gender policy, which states that 60 per cent of women who apply should receive land title.²²

There are copper-mines in other parts of the world too, with different problems. Bougainville is a little-known island that forms part of **Papua New Guinea** (PNG). Conzinc Riotinto of Australia (CRA) began mining there in 1964 as the majority shareholder of Bougainville Copper Limited (BCL), with the national government as a minor partner. BCL was granted the licences

that it needed, miners from other parts of the country were attracted, and one of the biggest copper-mines in the world was established by the 1970s. The open-cast mining created a hole with a surface area of 7km², 500m deep (i.e. about 2.5 square miles in extent and 1500ft deep). The disposal of 150,000 tons of rock-waste per day caused a massive environmental disaster, with losses of land, drinking water, and forest. Tributaries to local rivers were blocked, erosion and waste caused very high sediment levels, water and sediment were contaminated with heavy metals, and fish stocks were depleted. CRA/BCL became hugely profitable, and profits from licences and direct earnings for the national government amounted to almost half of PNG's national export earnings. However, the local (provincial) government was receiving only a fraction of the earnings, and local landowners even less. The traditional way of life of the indigenous population was severely threatened. Land was lost for agriculture, people were alienated from their land, land was polluted, and yields declined. The locals remained a minority among the mines' employees, while management remained entirely in the hands of expatriates. Roads were built, health and education services for the local population were established, access to markets and communication improved, and these changes were appreciated: 'Bougainvilleans are unlikely to seek to withdraw towards self-sufficiency and subsistence economy' (Böge 1999). It is, however, not surprising that the local population felt neglected and exploited, and that a nationalist independence movement emerged. The reasons for this are of course far more complex than simply 'environmental degradation': they include issues of identity and ethnicity. The traditional land-control patterns are highly complex, and payment of (limited) compensation caused tensions among the locals too. A young generation formed a 'new' association of landholders, which developed into an armed independence movement. Talks could not prevent civil war from the late 1980s onwards, fought by the PNG forces with help from Australia. Later negotiations resulted in a failed attempt to establish a regional peace-keeping force, and a further escalation of hostilities. Gross violations of human rights by the PNG forces and attempts to use foreign mercenaries were reported around 1996 (for example by Amnesty International), but the political scene in PNG changed with the elections of 1997. Hostilities have still not been resolved, and the State and the independence forces each control a part of the island; but several initiatives to find a solution are being taken by churches, women's organisations, and village leaders. Nobody is earning much from mining these days, the environmental problems have not been resolved, and war has devastated social services and livelihood opportunities.²³ Negotiations, a peace settlement, and an inclusive development strategy are the only way out.

In the **Philippines**, where large national and international companies are expanding their mining activities, concerted efforts by local, national, and international NGOs and local leaders of ethnic minorities have achieved important legislative changes regarding the recognition of rights over 'ancestral domains'. In this success there was and is an important role for artists and participatory theatre companies to express cultural values, to raise public awareness, and to mobilise support. Nestor Horfilla, an activist, actor, and theatre director in Mindanao, commented that 'the primary reason why ancestral domain is a major cause of contention is because ancestral territories are considered public domain. It is from this generalisation in law that concern has arisen over the indigenous people's rights and their pursuit of self-determination.' Theatre, music, and storytelling are used to reassert and rediscover identity, and also to communicate to the wider public the spiritual and practical values of land for indigenous people and the conflicts that arise from the entry of mining companies (whose 'rights' are granted by central government). Practical improvements in livelihoods are sought through forms of sustainable agriculture, and national lobbying for changes in land legislation has begun to result in recognition of the rights and needs of indigenous minority people. Crucial to these successes are the enthusiasm, professionalism, and dedication of NGO staff (activist-actors, or ATORs), the strong links between local leaders and NGOs, and national networking.²⁴

Rainforests in Brazil

Rainforests are regularly in the news. Their destruction intensifies the global 'greenhouse gas' problem and accelerates global climate change, because they act as an important 'carbon sink'. They are depleted by tree loggers, or destroyed and converted into tree plantations, as in Indonesia, where the forest fires of the late 1990s were associated with such conversion. Rainforests contain a large proportion of the world's total wildlife and biodiversity, with implication for pharmaceuticals and tourism. Above all, rainforests are the homes and livelihood sources of indigenous people, who have lived in and with them for thousands of years and who are powerless against the economic and political interests of so-called developers. Feeney (1998) shows that the World Bank, the European Union, and bilateral donors, in collaboration with national governments, often fail to involve affected people in development projects, in particular in the earlier stages, when important decisions are made. Participation, intervention, and lobbying by local, national, and international development NGOs has influenced legislation and project-management procedures, and has attracted and sparked off people's movements, for example in Rondônia State in the Amazonian region of Brazil. A regional development project funded by the World Bank began in 1980 with an initial budget of more than 1.5 billion US dollars, in response to the impact of

colonisers and in particular the expansion of ranching at the expense of rainforests and the indigenous population. In the 1980s, migration into the area intensified, deforestation continued apace, and landlessness and inequality became a big problem; but the project's funds were used to further the political aims of the elite. NGOs challenged the World Bank on its project design and behaviour, and also called the local authorities to account. Since the mid-1980s the MST (Movimento Sem Terra), a national movement of landless people, has been working in Rondônia. Its methods include direct acts of resistance, such as occupations of land,²⁵ which have been violently opposed and have led to the deaths of squatters. In 1992 the World Bank and Rondônia State authorities conceived a new approach to the project, renaming it as PLANAFLORO, with pro-poor and environment-friendly aims, and with participation of rural poor people as a declared objective. NGOs achieved the right to participate in the project and continued to lobby the World Bank. International NGOs, including Oxfam, funded meetings and training of local stakeholders, and initiated a study of civil-society participation in the project. The latter revealed 'great dissatisfaction with the project's failure to incorporate grassroots proposals into the planning process'.²⁶ (Grassroots groups are rural workers, including women and men, indigenous people, and rubber-tappers.) Feeney (1998) concludes that there remained an excessively top-down and technocratic project-based approach, even though high-level World Bank officials were concerned and concessions were made, and the project 'was fashionably restyled as a participatory project'.²⁷ It is obviously difficult to turn around such a large project towards real and effective empowerment of local people, even though poor and marginalised Rondônians themselves have taken initiatives, and local, national, and international NGOs supported them.

Pastoralism and wildlife in Tanzania

The interest groups who argue for nature conservation and the tourist industry are mostly based in the industrialised West, but they have particularly strong influence in Africa, where several of the most renowned wildlife parks can be found. There is a growing level of recognition that local farmers, hunters and gatherers, and pastoralists can no longer be simply excluded from the land that once was their main source of livelihood, and that they can and should play a crucial role in the actual conservation of lands, forests, and wildlife. Large international organisations such as IUCN and WWF now promote 'community-based conservation'.²⁸ The Campfire programme in **Zimbabwe** is probably the most frequently cited example: local associations of rural people manage resources, get benefits in terms of jobs and finance for social services, and indeed maintain good stocks of wildlife for tourists to admire. There is criticism of the programme: some hold

that the actual success of Campfire in benefiting local livelihoods *and* wildlife is overstated. Elsewhere there are still many examples where local people are marginalised by the entry of external investment in nature-tourism and by corruption of officials.

In **Tanzania**, Oxfam is supporting lobbying and court cases brought by community groups and national NGOs regarding the appropriation of grazing land by commercial companies. The land is in the so-called buffer zones, just outside the Serengeti National Park. It was legally allocated to Maasai communities (i.e. land is held collectively). The Maasai had already been deprived of their traditional pastures when in 1959 the colonial administration banned them and their cattle from what became this world-famous wildlife park. Through persuasion and fraud, commercial companies acquired documents in support of their land claims; for them, access to administrative and legal structures is much easier than it is for the largely illiterate, traditional, and remote Maasai communities. The legal support for the communities has paid off, and at least one of the court cases filed by the people of Ololosokwan village against a wealthy land investor has been won. Nevertheless, the land remains insufficient for re-establishing the pre-1959 livelihoods, when moving cattle over very large distances was part of a strategy of maintaining large herds even in times of drought. Drinking-water for people and cattle is still insufficient in the buffer zones of the Park and in the nearby Ngorongoro Conservation Area, where herding is still possible, but agriculture is not. Women usually stay near homes in the buffer zones and have taken up agricultural crop cultivation, which plays now an essential part in survival. Their burden increased, but their rights and social status did not improve, for example in terms of decision making over household money or community affairs. National and international political and economic interests are such that it is very unlikely that the Maasai can ever return to their traditional livelihoods, and social changes among their communities will prevent that too. Livelihood alternatives are sought, in particular in tourism and so-called community conservation projects. If local people are to benefit from those initiatives, and indeed get new livelihood opportunities and the opportunity to change their lifestyles at a reasonable pace, then secure rights to land and to wildlife are required. The Maasai themselves generally do not hunt (and therefore do not directly harm wildlife), but if existing hunting rights were to be transferred to them, then they could earn income from tourist hunters, develop this form of tourism on their own terms, and ensure that hunting was limited to a sustainable level. Strong support for local education, skill development, and participation in structures of governance is also essential if change is to take place on the terms of the Maasai women and men themselves.²⁹

Also in Tanzania, in the Singida region, land of the Barbaig people has been turned into large-scale wheat farms, run by the government with foreign support. The Barbaig are pastoralists, as are the Maasai, but they keep far fewer cattle now than they did in earlier days. Pastures, forests, and the habitat of large wildlife have all suffered as a result of the wheat farming; men have become dependent on alcohol; women's burden has increased; and conflicts with other ethnic groups have arisen. However, the Barbaig have started a litigation process in order to get compensation for the land; there is now a community development programme that seeks to support alternative livelihood strategies; and the Barbaig case is supported by the lobbying efforts of national NGOs.³⁰ During the 1990s, controversy arose over the radical recommendations of the 1991/92 Presidential Land Commission of Tanzania. These proposals were greatly weakened through the intervention of international experts who promoted strong privatisation of land, and through secretive dealings in the Ministry of Lands. Actual government policy and new legislation continue to promote the centralisation of land control and 'modernisation', by giving extensive rights to (foreign) private companies. However, the fight of NGOs for legislation that serves land users rather than bureaucrats continues, in part through the work of the National Land Forum (NALAF) and also the Land Rights Research and Resources Institute (LARRI) in Dar-es-Salaam. Recently a new version of the Land Act has been passed through parliament, incorporating many of the proposals of NALAF and LARRI. This Act regulates the rights of land users and the various conditions under which land may be alienated (i.e. claimed by or transferred to – for example – private or State enterprises) for three categories of land: 'village land', 'reserve land', and 'general land'. Some international development agencies have long supported their research and proposals for legislative change, in the interests of decentralising and democratising access to and control over land, with specific attention to the land rights of women.

5.2.2 Biodiversity and agriculture

The Green Revolution

The so-called Green Revolution of the 1960s and 1970s is widely seen as having made a major contribution to increased food production, for example in India and Indonesia. It promoted hybrid seed varieties (High Yielding Varieties – HYVs – which are normally grown from in-bred seeds with very weak reproductive capacities), widespread use of fertilisers and chemical pesticides, increased irrigation, and a basic level of mechanisation. It has contributed significantly to national food security in several countries. The Green Revolution has, however, not managed to eliminate rural poverty and rural food insecurity. It promoted agricultural practices that were based on external inputs (i.e.

external to local agro-ecological systems) of agro-chemicals; natural soil fertility and organic-matter content has been depleted; soil erosion is enhanced; and health risks (indeed, incidence of death from poisoning) have increased with the use of pesticides. The technological package that was promoted was relevant mainly to land of higher potential, which led to geographical and social inequality, because such land tends to be in the hands of the better-off farmers. Farmers' dependency on external inputs (provided by the State or private enterprises) sharply increased. The medium-sized to large farms benefited, while smallholders and subsistence farmers did not gain any advantage at all, and some actually became worse off. Total, national production increased in several Asian countries, but that effect was not substantial in much of Africa; even where it happened, inequality sharply increased. Landlessness increased in the wake of inequality, in part attributed to the Green Revolution, especially because mechanisation increased productivity per worker, so that the share of income from agriculture that went to (wage) labour declined.³¹

'Green Revolution' ideas and technologies are still dominant in the research and extension services of many developing countries, and also in donor organisations. However, increased inequality and environmental degradation pose questions about the appropriateness of the approach and technologies, and in particular about the level of consultation or participation of women and men farmers in research and extension. The degradation of soil fertility and increased pest resistance have provoked more dependency on fertilisers and pesticides, and are jeopardising further increases of area-productivity. The production increases that followed the introduction of newly bred strains of rice and other food crops are no longer as dramatic as they were when the HYVs first appeared. Furthermore, productivity increase per labour input is stalling or slowing down now, partly as a result of reduced expansion (potential) of irrigation systems, while a lack of alternative employment opportunities forces agriculture in many countries to absorb labour surplus (and this keeps wages of agricultural labourers very low).

Food security and sustainable agriculture

Famine is rarely a question of overall supply or food availability, because food security depends on people's 'exchange entitlements', i.e. whether they can actually claim the available food or not.³² The rural poor are often strongly dependent on home production for their food security, which in turn depends on their exchange entitlements to three particular assets (i.e. *capitals*): (a) **land for cultivation** (and therefore the quality of land and land-tenure relationships), (b) **capital for investment** in inputs and infrastructure, and (c) **human capital** (i.e. the potential to work, the knowledge of farming techniques, etc.). In many developing countries, NGOs and grassroots groups play a significant role in the development of 'low-external-input sustainable

agriculture' (LEISA) (or organic farming, conservation farming, permaculture, or some other label for this alternative form of production, technology development, and social organisation). These forms of sustainable agriculture depend particularly on a fourth asset, a form of natural capital, which is (d) **biodiversity**. The productivity and resilience of conservation farming depend on the diversity and the particular qualities of crop varieties that have been selected and bred over thousands of years, and on the diverse organisms in local ecosystems, which include predators and repellents of crop pests. Biodiversity plays a central role in livelihoods of fisherfolk and forest dwellers too, where food-gathering activity, combined with a certain management or harvesting strategy, is the main form of human interference. In agriculture, however, human interference with ecosystems goes much further.

'Sustainable agriculture' comprises a range of techniques and approaches that have been promoted by the FAO, UNDP, and Agenda 21 (at UNCED), and particularly by the more progressive non-government development organisations. Interpretations of sustainable agriculture differ, but most agree on the following aspects:³³

1. Research and development of technologies that maximise *local* resources (inputs), improve soils, reduce pollution and health risks, etc. (Examples of such techniques are crop rotation, integrated pest management, green manuring, agro-forestry, alley cropping and intercropping, diversification of crops, and locally improved varieties.)
2. Participation of women and men farmers in technology development and technology adaptation, leading to technologies that are particularly relevant to poorer farmers (who usually have comparatively little labour available in their families).
3. A gender-sensitive approach to technology development and extension (responding for example to the need of women farmers to combine food production with daily reproductive tasks).
4. Improved land-tenure security, for women and men, particular minority ethnic groups and marginalised castes.
5. Decentralisation, of research and extension services in particular.
6. Improved infrastructure related to financial services, processing, and marketing.
7. Promotion of agro-ecological systems that combine livestock, crops, and sometimes forestry and fish farming.
8. National and international pricing and market policies that stimulate local production and product diversification.

A biotechnological revolution

Biotechnological developments are regarded by some as the source of the next technological revolution, comparable with the electronic, computer, and information revolution in the twentieth century. Others describe the health and environmental risks of 'genetic modification' as 'paralleled historically only by the splitting of the atom' – according to one genetic scientist, who goes on to comment: 'It will be a high price to pay for the arrogance of a species which meddles with the blueprint of nature disregarding the responsibilities that come with such power'.³⁴ There are obvious risks from these technological developments, and potential benefits too. FAO data for 1999 show that 790 million people worldwide are suffering from food insecurity. Staple-food production is globally sufficient and continues to increase, but at a slower rate than in the 1970s, and global food stocks are relatively low. On the other hand, global cereal prices at the end of the 1990s were below where they were at the beginning of the decade, and the trend is further downwards.³⁵ Proponents argue that we need rapid technological innovation to feed growing populations; opponents argue that there are severe environmental, health, and socio-economic risks attached and that the apocalypse is not close at all, while alternative routes to increasing production exist. Table 5.4 summarises the arguments in favour and against relatively unregulated genetic modification of crops.

Table 5.4: Food security and the genetic modification of crops³⁶

| Opportunities and gains | Risks and losses |
|--|---|
| <ul style="list-style-type: none">• Higher yields and labour productivity, e.g. from GM crops that are salt-tolerant, resistant to pests and drought, or nitrogen-fixing.• Investment, research, and rapid technology development fuelled by profits accruing to holders of patents for genetic materials and production processes. | <ul style="list-style-type: none">• Many unpredictable effects, including unexpected side-effects (since nobody knows in advance exactly on which chromosome, and where, to put the exotic gene); genetic instability (after some generations, the crop has fewer or more copies of the inserted gene); a weakening of other plant traits as a result of 'overwork' (as in the case of permanent production of a pesticide by the plant itself); and, in particular, the risk of genes being transferred to other plants, with unknown consequences (which happens in nature in various ways). These unknowns imply threats to human and animal health, to wild plants, crops, and agro-ecosystems, even though probabilities of severe problems are small. |

Table 5.4: Food security and the genetic modification of crops (continued)³⁶

| Opportunities and gains | Risks and losses |
|--|---|
| <ul style="list-style-type: none"> • Reduced costs for producers e.g. from reduced dependency on external inputs such as fertilisers and pesticides, and increased effectiveness of herbicides; possible benefits from reduced pollution with agro-chemicals. • Cheaper products, including staple foods, for consumers in developing countries that are net importers of food, because of higher productivity in industrialised countries. • Improved quality of fruit and vegetables on supermarket shelves from suppression of ethylene-producing genes. • Improved flavour, texture, and nutritional content; elimination of allergens and toxic substances; etc. • Production of vaccines, biodegradable plastics, etc., from GM plants and crops. | <ul style="list-style-type: none"> • Large-scale GM-crop farming makes GM-free and organic farming <i>de facto</i> impossible. • Natural soil fertility declines through the reduction of the activity of nitrogen-fixing bacteria. • Monocultures and contracts with large companies lead to further losses of agricultural biodiversity. • GM crops that are resistant to herbicides and pesticides will stimulate their use, causing increased natural resistance of weeds and pests to these same agro-chemicals, which in turn stimulates their use, and can lead to 'super-weeds', such as rye grass in Australia. • GM technology and its products are monopolised through patenting by transnational companies, whereas <i>public</i> research and publicly available knowledge was the main driving force behind the (qualified) success of the Green Revolution. • Financial benefits are denied to developing countries and the generations of farmers who have domesticated crops and improved genetic traits through selection. Patenting systems and current breeders' rights systems allow pirating by companies that transfer or delete a few genes among thousands. • Increased liberalisation of food markets and greater corporate control of the production process leads to more cash-crop production and fewer food crops grown on farms, which increases smallholders' vulnerability to crop failure and sudden food price rises. • Corporate control over production inputs, markets, and products increases, at the expense of smallholder producers, through input-packages (certain seeds respond positively to branded agro-chemicals). |

Table 5.4: Food security and the genetic modification of crops (continued)³⁶

| Opportunities and gains | Risks and losses |
|---|--|
| <ul style="list-style-type: none">• Development of GM plants for removing toxic chemicals from soils. | <ul style="list-style-type: none">• GM varieties extend the range of crops and crop products that can be produced in Northern temperate zones, and these compete with or substitute for developing-country export products (e.g. rape-seed engineered to produce lauric acid, which is traditionally derived from coconut oil from the Philippines and other tropical countries).• GM crops are introduced faster than the development of the regulatory capacity in poor countries and also in many rich countries.• Biotech companies bear little or no liability for any damage to the environment or public health resulting from use of the GM technology or crops. They deny liability even though they argue that there are no risks. |

The alternatives to patented crops controlled by a handful of international companies are in the realms of sustainable agriculture. International companies who modify and patent the genetic materials spend much of their energy on developing herbicide-resistant or pesticide-producing varieties. These applications risk damaging ecological diversity and resilience, and they are at best irrelevant for the smallholder farmers who cannot afford the input packages and whose families make up the majority of the almost 800 million undernourished people of the world.

The advantages and disadvantages listed above suggest that the advance of genetically modified crops and plants is neatly intertwined with the development of international economic policy, in particular trade-related policy that is now regulated under the World Trade Organisation (WTO). In India and Brazil, for instance, farmers are protesting against the prospect of genetically engineered varieties by burning experimental fields, and governments in Europe and elsewhere are trying to accommodate public anxiety about international trade agreements and the Convention on Biodiversity (CBD). This international dimension is discussed further in section 5.3.

Examples of sustainable agriculture

Alternative agricultural technologies are available and are developing rapidly, and some believe that their spread through formal extension services, international organisations, and particularly through NGO networks is already so substantial that the 'high tech' of genetic engineering will not be as dominant as the Green Revolution technology was, despite the efforts of 'big business'. Documentation is being produced to show that hundreds of thousands of farmers all over the developing world are adopting technologies that all in one way or the other minimise the use of pesticides, increase the effectiveness of local resources to maintain soil fertility, or improve the water-holding capacity of soils. The increases in yield achieved by alternative technologies are very substantial,³⁷ and that simple fact is likely to be the single most important reason for their spread.

The idea of sustainable agriculture and that of partnerships between researchers and farmers has found support in many national and international NGOs and coalitions. Lobbyists have also called for arrangements that will enable developing countries to export to rich countries, and for comparatively long (transitional) periods of import protection in order to develop alternative crop-production systems, for example in the case of the banana trade to Europe from small island states in the Caribbean. NGOs and activists in India and Brazil run campaigns against the excesses of biotechnology and its corporate proponents, and in favour of alternative systems. Many of those, including MST in Brazil (a movement of landless people), have campaigned for years for improved access to land, as the key productive resource for poor rural people; they also have taken a public position in opposition to genetically modified crops and in favour of sustainable agriculture. MST trains thousands of women and men farmers in appropriate technologies, and its success seems to derive from the combination of that very practical work with land-occupations and campaigning.

The *campesino a campesino* (farmer to farmer) movement in **Central America and Mexico** has assumed the role of an alternative to government extension and technology development, and has influenced research and extension policies of governments across the region.³⁸ In farmer-to-farmer extension, volunteer farmers who are trained and who have increased productivity on their own farms promote changes in technology and management with neighbours; this happens largely without remuneration, on the principle that success should sell itself. In Cuba, alternative low-external-input agriculture has developed in a very short period of time, owing to the intensive efforts of government research institutes, forced by the collapse of the Soviet Union, the drying up of cheap oil imports, and the continued trade blockade of Cuba by the USA.³⁹ In a project in a mountainous and densely populated part of **Albania**,

permaculture design principles and sustainable agricultural techniques are being developed for application on local farms. This project stimulates local horticultural production and also that of staple foods under difficult agro-ecological and economic conditions, and with success.⁴⁰ Its achievements are partly due to the fact that there is a good market for the produce in this area, which has a substantial population and difficult transport connections.

In **Kenya**, many local and national NGOs work on conservation farming, with considerable success in improved vegetable production, increased household incomes and women's incomes, and improved environmental health. They are part of a reasonably well-functioning network in which some national organisations with international contacts have key roles. In Zimbabwe, national NGOs and alternative networks have promoted organic farming for years, helped by international contacts. In all these cases, some form of beneficiary participation in technology development is seen as an essential and integral part of projects. The Kenyan NGOs (and also NGOs in other countries) are attempting to increase the staple yields of thousands of farming families, and have initiated close collaboration with researchers from government and international research organisations and also from the alternative NGO circuit (which focuses on organic farming). However, national and international movements for alternative forms of agriculture do not always amount to campaigns that aim to change the behaviour of government extension services and their research policy. In the Kenya case there is still a lot of unexplored potential in this sense. Furthermore, the Kenyan NGOs, like their counterparts in India and Brazil, have started to work on the policy context of trade regimes and farm-gate prices, advocating more research in support of environmentally sustainable agriculture.⁴¹

In **Brazil** the so-called Hunger Campaign reached a peak in terms of media attention, private donations, and grassroots activity around 1993-94. After the election of President Cardoso in 1995 and the death of the movement's leader, the human-rights activist Betinho, in 1997, the campaign lost its momentum. That is of course in the nature of campaigns: a period of growth and success, followed by one of decline and then transformation. The campaign developed out of a movement called Citizens' Action, in 1989, and became known for its highly creative and diverse initiatives, different in every State, yet spanning virtually the whole country. The Hunger Campaign set up a plethora of local, diverse initiatives aiming at achieving food security. This included the stimulation of rice cultivation by Kaiapo indians in Goiânia.⁴² In Bahia State, a Carnival Without Hunger campaign was launched, and food distributions were organised in communities living around refuse tips in Mato Grosso State. In Alagoas a project called 'The Community Sings' was allocated land to establish an agricultural co-operative. The national campaign lost

momentum, but several local initiatives continue, with funds raised from local business and councils, and through mergers with other groups. They have raised national awareness of poverty and destitution and its causes, and helped many poor and vulnerable people, rural and urban dwellers alike.

In most countries, the focus of the alternative agriculture movement is on the poorest farmers, or at least smallholders, prompting a debate about whether it is exclusively concerned with technology for the poor, or whether it should be seen as an (environmental) alternative for all scales of agricultural production. It is true that technologies for the rich and for the poor are and should be different, because these groups do not share equal access to labour, capital, land, and other resources. However, there are benefits for all from various alternatives. Government resources are usually directed at technologies that are accessible for better-off farmers only, failing to support alternatives that are primarily of interest to the agriculture-based livelihoods of large numbers of people, if not the majority in the country (in Africa, and also much of Asia and Central America).

Wealthy and poor farmers have different investment abilities, aims (sustaining production or maximising profit?), consumption needs, abilities to operate in markets, and labour availability. Many of the principles and techniques of sustainable agriculture are, however, interesting in terms of cost and productivity, apart from environmental and health benefits, which should make them useful to all farmers, even though they need to be slightly altered, depending on the farmer's capabilities and resources. For example, nitrogen-fixating 'green manure' (such as a bean crop that is ploughed into the soil before maturing) aids productivity and improves environmental sustainability, and can compete with the use of chemical fertilisers (depending on transport, subsidy, and tax arrangements). Nevertheless, ploughing the green manure into the soil at the appropriate moment requires equipment, time, and/or investment, which poor farmers may not have. The very poorest are often left out in high-input farming, because they lack financial capital to invest, and may also be excluded from the benefits of low-external-input alternatives because of the high demands made on learning time and ability, and also on labour, which is not available in families of elderly widows, single mothers with very young children, the sick, or more generally the most destitute rural population.⁴³ Support for agricultural production can help to alleviate their poverty and improve their food security only indirectly. Economic growth is particularly associated with a shift away from an agriculture-based economy to an urban economy, with manufacturing and services that require energy and cheap foods. This so-called modernisation process comes with many problems for poor people and negative impacts on environmental quality, as the following themes and examples illustrate.

5.2.3 Industrialisation and urbanisation

Dams and electricity

The term 'river development' covers a wide range of environmental interventions: the canalisation of rivers; reduction of natural floodplains; construction of dams and reservoirs for electricity generation, irrigation, and possibly the provision of safe drinking water; the use of river water for industrial processes; and also the river's use as a conduit for sewage. Huge dam projects have not been relegated to history yet, despite many well-known problems such as people displacement, reservoir siltation, and other externalities (i.e. real costs which are generally not incorporated in financial calculations – see also section 2.2.4). National governments continue to conceive large dam-building projects, and often get financial backing from multilateral development banks and bilateral development agencies. At the heart of the arguments for proceeding with them (indeed for being enthusiastic about them) is the need for cheap and reliable electricity and water for urbanising populations and for industrialisation. This collaboration between national governments and international development agencies makes all the more obvious the need for a coalition of national and international activists who challenge the negative impacts on people, livelihoods, and environments.

Near a dam in the **São Francisco River in Brazil**, people are still fighting for compensation for the loss of land and livelihood, although the dam was completed in 1986 (this example is also referred to in section 4.1). The biggest ever such scheme is being implemented in **China: the Three Gorges dam project**. The dam in the Yangtze River will create a reservoir whose area will exceed 650km² (more than 250 square miles) and is expected to displace one million people by the year 2010, mostly from Sichuan province. The project is fraught with problems, not least because of corruption and the related compromising of technical standards by contractors and officials. Ecological systems will be upset, and – because people are expected to be moved higher up the hill and mountain slopes – soil erosion is predicted to increase substantially. Homes, factories, roads, and other infrastructure will all be submerged. River navigation is expected to improve, and vast quantities of electricity will be generated. However, as with other dam projects, critics point out that the same hydro-electricity can be generated by several smaller dams in the river's tributaries, which would reduce the risk of collapse and disaster for millions of people downstream, and limit disturbance to local residents and ecosystems. If earlier experience in other countries is anything to go by, and the criticism of activists and even of the Chinese Prime Minister Zhu Rongji⁴⁴ is only partly vindicated, the displaced will not be fully compensated for the loss of land and livelihood, and many will live in communities where they are unwelcome, or on lands where reconstructing a livelihood will prove to be very difficult.

Equally controversial and on a similar scale is the series of dams in the **Narmada River and its tributaries, in India**. The scheme consists of more than one hundred dams, some huge, and thousands of minor structures. It is designed to produce hydro-electricity and provide irrigation and also drinking water to a very large area. Here, too, poor people are suffering from ecological degradation, siltation, and disruption of local livelihoods. The total number of people who will be displaced by the dams, including the Sardar Sarovar dam, is now estimated to be 200,000, according to the authorities – but many more, according to others. The scheme was initially supported by the World Bank, but pressure of grassroots groups, national NGOs, and also international NGOs and changes in the Bank itself led to its withdrawal from the project. Protests and court cases have interrupted the construction of the Sardar Sarovar dam, and local NGOs have worked with affected people to get some compensation at least. The large majority of the people affected by this dam and the thousands of others that were built in India (especially since Independence) are ‘tribal’ minorities and Dalits (untouchables). In other words, the social under-classes of India are bearing the brunt: ‘India’s poorest people’s are subsidising the lifestyles of her richest’.⁴⁵ Their lands, culture, and lifestyles are being disrupted severely, no matter what compensation is offered. Nevertheless, the Indian government is persisting in its determination to produce electricity for urban populations and to ‘modernise’ agriculture with large irrigation systems.

National activists in China with strong concerns about the Three Gorges project have great difficulty operating in a country that tolerates only very limited opposition against government decisions and projects. In India, coalitions of activists have proved to be difficult to maintain, which means that there is not always a single opposition front. Despite a large political space for NGOs, activists, and ordinary people and a greater degree of political openness than in China, the Indian establishment manages to force its case through political decisions, bureaucratic support, and court cases: construction is continuing, despite some delays.

Industrial pollution

Industrialisation often leads to increased competition over natural resources such as water and (agricultural) land between (formerly) rural people and industries, and it also causes environmental pollution. It thus affects negatively the livelihoods and environments of poor and vulnerable women and men on the fringes of cities. This happened and is happening in Java, **Indonesia**, for example, where households replace fuelwood with kerosene, have to accept lower quality of domestic water, reduce the numbers of their domestic animals, and change the management arrangements for common resources. However, not all change is bad. One conclusion is that women cannot simply be assumed to be the victims of changes in the availability and

quality of natural resources; in the process of industrialisation, gender roles change, (employment) opportunities appear, and both women and men adapt to the changing circumstances.⁴⁶

Once established, industries tend to be surrounded by residential areas of poorer people who are interested in working in them, but who also suffer the often unseen effects of pollution. The occupational environment of workers is of central importance in large-scale industries, but also in small-scale and 'informal' workshops, as is argued in section 3.1.1 with the example of engineering workshops in Bangladesh. There is increasing evidence that exposure to toxic substances in and around industrial areas affects brains and intelligence (especially of children), and that male fertility is affected by the presence of agro-chemicals, female hormones, and other pollutants in drinking water in urban areas. There are in particular reports of effects on children, with asthma, lead poisoning, and a range of other health problems. Children, women, and more generally the poorest and most vulnerable often find employment in the harshest of circumstances, with severe impacts on their health.⁴⁷

Industrial disasters have, of course, the biggest impact, as in **Bhopal, India**, where toxic gases escaped from a pesticide plant owned by the US company Union Carbide on 2 December 1984. Thousands of people were killed and many more suffered respiratory and eye ailments. In the aftermath there were also reports of miscarriages and female infertility; true or not, young women's marriage prospects were affected. Compensation fell well short of what was expected, and was in fact jeopardised by Indian legislation adopted *after* the disaster: 'special legislation *diminished* the rights of victims through giving the state absolute control over claims and denying liability for future generations'.⁴⁸ This terrible disaster sparked various spontaneous protests immediately following the gas leak. Several activists got involved, but they were by no means all local, and they had different and conflicting opinions and priorities. In fact, the initial public action was centralised and dominated by middle-class groups, and consequently it missed opportunities for building local and international solidarity links. Later the survivors began to organise themselves, but again conflicts between different organisations and leaders hampered the success of their demands for recognition, compensation, and jobs. They did not manage to forge a strong international and national solidarity movement, which would be an obvious goal, given the scale of the disaster and the fact that Union Carbide is a company with activities in more than 100 countries. A further lesson to be learned from this disaster is the need for the generation and dissemination of information, in order to create links with other groups and especially to establish liability. Both the company and the Indian authorities continued to suppress the publication of crucial facts.⁴⁹

Homes, services, and infrastructure

In broad terms, there are three ways to reduce (urban) poverty: (a) increasing income and/or assets; (b) upholding human rights, particularly civil and political rights; and (c) improving housing and basic social services.⁵⁰ Prominent in the latter category is the *securing* of housing *tenure* as a basis for progress in so many of the other areas, because security of tenure means that financing for housing improvements can really take off: for many people, secure housing provides a basis for income generation, and neighbourhoods can develop strong action to claim improved infrastructure and services. Only with secure housing (tenure rights) can urban infrastructure in poor settlements be expected to improve, and as a consequence environmental risks will generally be reduced.

Increasingly important in struggles for secure tenure are local campaigners who organise citizens and demand (legal) recognition from municipal authorities, and NGOs who train and advise the grassroots groups, often with support from international organisations. NGOs also support a plethora of groups and neighbourhoods to improve water supply and sanitation systems in their settlements.⁵¹ There are obvious reasons for this: the main health risks in poor neighbourhoods relate to hygiene, i.e. vector-transmitted and water-borne diseases such as malaria and diarrhoea.

In Recife, in **Brazil**, SCJP (*Serviço Comunitário de Justiça e Paz* – Community Service for Justice and Peace) is one of several NGOs that give legal and practical support to citizens' groups struggling for the improvement of their *favelas* (slums). New legislation from 1987 onwards defined the terms for citizens' participation in municipal policy making. It is seen as a very significant achievement that *favelas* have been made legal, that citizens' participation has been institutionalised, that plans are being made for improvements to infrastructure, that some investments have been made, and that the authorities are now really listening to the views of local people. Nevertheless, despite more than ten years of hard work and lots of talking in all kinds of forums, drinking water, sewerage systems, and electricity supply remain very basic. More and better co-operation between NGOs is needed, together with a stronger focus on practical achievements, according to a recent evaluation.⁵²

In Cairo, **Egypt**, a community of garbage collectors has suffered from environmental health risks ever since it emerged in the 1940s. The settlement of the Zabbaleen was not officially recognised, and the service that the people supplied to the city (collecting, sorting, and recycling garbage) is still not generally appreciated. Hardly any government support is supplied to this community. In response to public campaigning, supported by NGOs and the Coptic Church, the electricity network reached the neighbourhood in the 1980s, settlement rights were given, and people started improving their

houses and developing some businesses. By 1996 much had improved, but only some minor sewerage work had been done and drinking-water supply was insufficient, falling short of promises and plans that had been made, and harassment by certain authorities continued. There were also contradictions and tensions between different groups seeking influence in the community, including NGOs. However, residents have made enormous progress in terms of developing the ability and confidence to articulate their needs and challenge the negative portrayal of their community in the local press and on national television. However, this has not been appreciated by all supporting NGOs, most of whom are interested less in campaigning and more in 'doing' development projects. The local residents' struggle to get recognition of their role and support from government services in health care, sewerage systems, and better water supply continues.⁵³

5.3 Global environmental policy and campaigning

This section discusses international policies that affect environments and livelihoods, and campaigns and lobbying for change. The main international issues relate to climate change, biodiversity, and macro-economic policies.

5.3.1 Managing the global environment

The Earth Summit, held in Rio de Janeiro in 1992 under the official title of the United Nations Conference on Environment and Development (UNCED),⁵⁴ followed a similar conference 20 years earlier in Stockholm, and preparatory work by the Brundtland Commission, which produced the report *Our Common Future* in 1987.

At UNCED the Rio Declaration was agreed; it states 27 principles for sustainable development, but is not legally binding. Possibly the most significant output was Agenda 21, which is a programme for promoting sustainable development from 1992 through the twenty-first century. It contains chapters on almost all environmental topics, from seas, atmosphere, human settlements, and land to desertification, mountain development, sustainable agriculture, biotechnology, and hazardous wastes. There are also special sections on combating poverty, meeting the needs and rights of women and children and those of indigenous people, international relations, and partnerships with NGOs.

It is important to stress that implementation of Agenda 21 is to a great extent a local matter. Local authorities and citizens' groups are encouraged to address issues that range from pollution and transport to improvement of human settlements and waste collection and recycling. Unsurprisingly, this is happening in particular in the industrialised world and middle-income

countries, where more resources are available.⁵⁵ With support from the World Bank and bilateral development agencies, many countries have produced or are producing national sustainability strategies (see also section 5.1.1), and developing national structures and skills with the support of the Capacity 21 programme, an initiative of UNDP.

Much environmental management in developing nations relates to reducing vulnerabilities and hazards, which often play a role in conflict generation, extreme suffering, and environmental destruction, as is discussed in sections 2.3 and 4.2.3. Environmental causes of disasters include climatic drought, volcanic eruptions, earthquakes, and cyclones. Human causes include mismanagement, over-consumption, and deforestation (leading to climate change, death from toxic spills, and river floods). Disasters are another source of environmental impacts, including the consequences of human displacement such as deforestation and soil erosion, and impacts from floods and oil spills on biological diversity and soil quality. The causes of disaster and extreme suffering are thus a mix of factors, local and global, human and natural. Some of them can be addressed by policy-influencing activities. Important lobby targets and international response agencies in this field are the UNHCR, World Food Programme (WFP), UNEP/OCHRA, the European Union (EU), and also national governments.

Many Third World countries remain marginal to most international discussions and negotiations, except for nations such as China, India, and Brazil that are significant in terms of population, economic power, and military strength. Furthermore, many Southern leaders seem to believe that 'the environment' is the problem of rich nations in the North, and if there are global environmental problems *for* the South, it is still the North that causes them. That sort of reasoning enables the governments of developing countries to deny their responsibilities and the need to act, yet it does not necessarily put them in a position to influence global problems. Moreover, some are rapidly catching up with the industrialised world in creating and enhancing global (and local) environmental problems.

Some of the main global environmental threats are related to climate (as is shown in section 5.3.2), and they are not alleviated by human activity. They include cyclones, droughts, and floods. River management, river floods, and dam failure can have international consequences for obvious reasons, as can industrial pollution of water and air, all of them affected by human interference, or even caused by people. For example, toxic effluents can kill fish in rivers and coastal waters and destroy the livelihoods of fishing communities. The nuclear disaster in Chernobyl affected natural resources, animals, and crops, locally and across northern Europe. Volcanic eruptions and earthquakes are not caused in any significant way by people, and their

effects are usually local only. Nevertheless, large volcanic eruptions can have a global impact because of the gases and ash that enter into the atmosphere, and which lead to global climatic changes for periods of possibly several years.

Very important policy developments that affect the global environment and local resources are taking place in the realms of international trade, with the WTO at the centre, and also in the regulation of financial flows and investments and 'structural adjustment', with the IMF and World Bank in the limelight. Global trade regulation under the WTO at best ignores environmental change where it is stimulated by trade regulation; in several cases the WTO has ruled that trade restrictions on environmental grounds are not allowed, which appears to contradict international treaties on environmental protection and sustainable development. The impact on environmental sustainability of the various policies that are included in 'structural adjustment' appear to be mixed, but far too little is known for the real effects to be asserted with confidence (see also section 5.3.2). Environmental change remains marginal to many of those policy developments, even though there are enormous implications for 'global commons' and poor people's environments.

5.3.2 Global climate change

Among the key trends and shocks that are outside the sphere of influence of poor people and citizens' groups and also that of most developing-country governments are changes in climates and their effects on people and their environments. These changes are to some extent the result of human behaviour, however. There is widespread agreement that the so-called 'greenhouse effect' is real and is leading to a rise in the average Earth temperature, and this appears to be associated with increasingly erratic climatic behaviour. Exactly how much change is taking place is not agreed, and the actual consequences for particular countries and regions are both uncertain and in some cases controversial. The facts add up to an alarming picture. This section discusses global climate change, global warming, the greenhouse effect, sea-level rise, the *El Niño* phenomenon, and some of the ways in which the impact of these changes might be mitigated.⁵⁶

1998, a year of climate change

In 1998 there were several 'natural' disasters, which – according to Munich Re, a German insurance company – caused economic damage costing almost \$US 100 billion. However, insurance cover was less than \$15 billion, and related mostly to disasters in the USA. The company claims that three times as many natural disasters occurred annually in the 1990s as in the 1960s, and that annual economic damages (adjusted for inflation) are now nine times what they were 30 years ago. Insurance cover is lowest in developing countries, where the greatest damage is done and most lives are lost. In 1998, Hurricane

Mitch hit Central America and George hit the USA and Caribbean; a cyclone hit Gujarat, India, and there was bad flooding in Bangladesh. Russia, Indonesia, and the Amazon region suffered drought-induced forest fires, and in some Latin American countries crop harvests were reduced by droughts. Scientists warn that warming of surface water in the oceans affects coral reefs, which are important breeding grounds for fish.⁵⁷

According to the World Meteorological Organisation (WMO), 1998 was by far the warmest year on record (systematic measurements began about 160 years ago), and the ten warmest years have all occurred since 1983. Temperature increases happen unevenly: that is, some areas will become significantly warmer, while others may not notice much change. The temperature changes are associated with relatively rapid shifts of agro-ecological zones and shifts in the potential for food production: some areas may be able to produce better as a result of longer summer periods, while others may be less fortunate. There are also risks that disease vectors are enhanced, in particular that tropical diseases such as malaria will spread to temperate climatic zones. However, far greater risks are posed by the increasingly erratic behaviour of climates as a result of the greenhouse effect and average global warming.

The greenhouse effect

Water vapour and certain gases in the air 'trap' the long-wave radiation from the earth's surface into space. (The radiation came from the sun in the first place: sunlight bounces back from the earth's surface, but in the process the wavelength becomes shorter, making it eligible for 'trapping'.) This happens in the same way that the glass walls of a greenhouse 'trap' radiation that bounces back from the ground surface. As a result, the earth and air get warmer. Water vapour is naturally in the air, as are small amounts of the so-called greenhouse gases, but this effect is enhanced by the (extra) gases that human beings have contributed to the atmosphere since the Industrial Revolution of the eighteenth and nineteenth centuries. The main greenhouse gas is carbon dioxide (CO₂), which is produced by burning fossil fuels. Also important are chloro-fluorocarbons (CFCs, from industrial processes, fridges, air-conditioners, and sprays) and methane (CH₄), which is produced in rice paddy fields and by ruminating animals (of which cattle and goats are the best-known examples).

Global warming

A rise in the average temperature of the Earth is the result of the global greenhouse effect. The rise since the 1880s is generally agreed to be about 0.5 degrees Celsius, and a further rise of 0.5–2.0 degrees is expected by 2050. It is hard to predict the exact rise of the average temperature, because of the many uncertainties that are associated with various 'feedback mechanisms'. For example, cloud cover will be affected by temperature rise and changes in

regional weather patterns. If the total global cloud cover increases as a result of warming, it means that less radiation can come in from the sun, and the warming effect is thus reduced.

Temporarily lower average Earth temperatures can be caused by several phenomena, including volcanic eruptions that bring very large amounts of gases and ash into the atmosphere which screen off radiation from the sun (and potentially cause a 'volcanic winter'). This happened following the eruptions of the Pinatubo volcano in the Philippines in 1991 and 1992. Nevertheless, volcanic eruptions also bring large amounts of greenhouse gases into the atmosphere, which have a warming effect.

A far more alarming possibility (although of low probability) is suggested by analysis of historical global temperatures. They have been comparatively very stable over the past 10,000 years, but immediately before that they fluctuated heavily by up to 8 degrees Celsius over periods of mere decades. The last 10,000 years is roughly the period since the start of agriculture, and this period is extremely short when put in the perspective of the age of the Earth and its atmosphere – about 4.5 billion years, during which climatic stability must have been rare. Some scientists believe that human influence on global climates will not just cause a gradual warming but could trigger some kind of collapse or sudden change in the Earth's weather systems and ocean currents, and the heat exchange between the two. This kind of 'collapse' is most likely to result in rapid cooling of the Earth.⁵⁸ (The 'collapse' possibility fits in with the Gaia hypothesis of Lovelock, which is briefly discussed in section 2.2.1.) The mere possibility of this happening should obviously be enough reason to take radical measures to reduce the impact of the greenhouse effect of traffic, manufacturing industry, electricity generation, and other consumption.

Climate-pattern changes

The temperature of the Earth will obviously not change everywhere by the average amount, and indeed the expected temperature changes are larger in the cold parts and less so in the tropics. However, temperature is just one factor in Earth's infinitely complex weather systems. It is almost certain that changes in climates will happen, but there is much uncertainty about *how* weather patterns will change. There is a strong probability that average rainfall (on a global scale) will increase, but that big increases are likely at high latitudes (i.e. in the far North and far South of the planet) and in what are now the humid tropics (that is, areas where rainfall is plentiful already). In the mid latitudes (between 30 and 60 degrees) and the interiors of Northern continents, rainfall is likely to decrease, causing drought. It is also possible, though not certain, that the frequency of extreme events such as droughts, floods, and cyclones will increase.

El Niño

The so-called El Niño Southern Oscillation effect (ENSO) is an as yet unexplained rise in surface-water temperatures in the Southern (equatorial) Pacific Ocean, off the coast of Peru. These higher water temperatures change weather patterns, and, in particular, they block the so-called South-East Trade Winds: that is, they block wet rains that originate from the south-eastern Pacific and prevent them reaching Indonesia and neighbouring countries. Furthermore, the El Niño phenomenon is increasingly seen to correlate with extreme weather conditions in all parts of the world, in particular with droughts and floods. For example, there was drought during the 1982–83 'El Niño year' in Central America and East Africa. Flooding in Bolivia and Peru would have been caused by increased heat flow from the surface water in the Pacific Ocean into the atmosphere, resulting in all kinds of knock-on changes in weather patterns. Later El Niño years were 1987–88 (which lasted into 1989), 1991–92, and (less strongly) 1993 and 1994. 1997–98 is seen as an unusually strong El Niño year; and El Niño reigned again in 1998. Following the latter, forest fires raged through parts of Indonesia and Amazonia, unimpeded by the expected rains, which did not arrive. Scientists have suggested that it is possible that the El Niño phenomenon is increasing in frequency from an historical 20-year cycle to maybe even one in every two years in future: the sequence of El Niño years in 1991–92 and 1993–94 is very unusual. Indeed, the frequency of El Niño has increased strongly since the 1970s. This increased frequency of occurrence is now being associated with global warming and the greenhouse effect. However, predicting the effects of El Niño events is still difficult: a drought and famine were expected in Southern Africa following the 1997–98 El Niño, but they failed to materialise.

Whether the reduced 'upwelling' of cold and nutrient-rich bottom waters has positive or negative effects on the ocean's capacity to be a vital 'carbon sink' is unclear as yet. It is possible that less carbon dioxide (the main greenhouse gas) is released from the South Pacific ocean than in normal years, while it absorbs carbon dioxide at other times in the Northern regions. Thus El Niño may constitute a blessing in disguise, even though it is a temporary effect. However, the droughts in 1997/98 in Brazil and Indonesia that are also associated with El Niño strongly exacerbated fires in (rain)forests that led to an enormous release of carbon dioxide – and the rainforests are supposed to be important global carbon sinks and oxygen producers, the 'lungs of the Earth', instead of the 'chokers' of the Earth.

El Niño was identified by fishermen who noticed unusually warm water off the South American coast, and correlated this fact with their markedly reduced fish catch. Because this was occurring around Christmas time (once in so many years), they gave the phenomenon its name: El Niño, 'the boy

child', which is a reference to Jesus Christ. More recently scientists have also identified another phenomenon, La Niña, the 'little girl', which is more or less the opposite of El Niño, i.e. unusually cold surface-water temperatures in the (equatorial) Pacific Ocean. La Niña would have some correlation with the increased frequency of tornadoes in the particular regions of the Americas, and is associated with less-than-normal moisture in the air over the South Pacific Ocean, resulting in less rain along the coasts of North and South America. 'La Niña events' occurred in 1985, 1988–89, 1995, and late 1998.

Sea-level rise

The current estimates of the future rise in sea-levels as a result of global warming range from 5 to 40 cm (2 to 16 inches) by 2050, but it is agreed that the increase might be much more than this, depending on various uncertainties. Global warming is causing thermal expansion of the sea water, and ice from mountain glaciers is melting; both effects can be estimated fairly well. More uncertainty exists over the rate at which the ice caps of the landmasses of Greenland and Antarctica are melting, while increased precipitation (snow and hail) in the areas near the North Pole and the South Pole can rebuild ice caps to some extent. Analysis of historical changes in global temperatures suggests that the possibility of the collapse of the so-called West Antarctic Ice Sheet is a real threat, although of unknown probability. It could lead to a sudden rise in sea levels of 6–7 metres (18–21 feet),⁵⁹ which would flood many countries.

The effects of sea-level rises can be devastating, especially if a somewhat high estimate of the rise – say one metre – over the next century turns out to be the case. Enormous costs will be incurred by several small island States, which will struggle for survival, and a large area of deltas such as those in Bangladesh and Egypt will be inundated, or at least threatened, if no measures are taken.

Global climate negotiations

All the above changes are associated with greenhouse gases and global warming, which in turn are in large part influenced by the release of carbon dioxide (CO₂) from burning fossil fuels. It is thus crucial for the world community to negotiate reductions of CO₂ production. The Climate Change Convention was adopted in 1992 in response to growing concerns over emissions of carbon dioxide, methane, and other greenhouse gases. So far, 175 countries have signed and virtually all have ratified the Convention: it took official effect from 21 March 1994. Its implementation is being taken forward by a series of special conferences. The so-called Parties of the Climate Change Convention met for the first official conference in Berlin in 1995, then in Geneva in 1997, in Kyoto in 1997 for the third conference, in 1998 for the fourth in Buenos Aires, and in late 1999 for the fifth official conference in Bonn, Germany.

It was agreed by the 159 countries represented at the Kyoto conference to reduce their collective emissions of greenhouse gases by 5.2 per cent of the 1990 level by the period 2008–2012. For 38 rich countries this reduction is compulsory; for developing countries it is voluntary. However, each country has a target, and in some cases an increase in emissions was permitted. Also established were the Kyoto Mechanisms, in order to reach emissions-reduction targets: the Clean Development Mechanism (CDM) aims to contribute to reducing emissions of greenhouse gases and promote sustainable development in the South. It will grant better-off countries credits, which will finance developing-country projects that avoid emissions and promote sustainable development. The principle of Joint Implementation and Emissions Trading offers credits for reduction in emission levels through projects in industrialised countries – credits which they can trade with other industrialised countries (including the countries of Central/Eastern Europe and the former Soviet Union). Thirdly, an international emissions-trading regime will allow developed countries to buy and sell emissions ‘credits’ among themselves. The Parties to the Convention are now elaborating the nature and scope of these ‘flexibility mechanisms’, the criteria for project eligibility, the roles of various institutions, and an accounting system for allocating credits. This negotiation is taking place mainly in technical committees.

The Kyoto Protocol was signed by 83 countries, plus the European Commission, and more governments are expected to sign up, which is necessary for the Protocol to become legally binding. Unsurprisingly, the strongest opposition to real reduction in emissions and progress in the negotiations comes from the biggest fossil-fuel consumer (in total and per capita), the USA, and from several oil-producing countries, all strongly influenced by the powerful lobby of large oil companies. The Buenos Aires Plan of Action, adopted in November 1998, set a deadline of late 2000, at the sixth official conference, for finalising agreement on all these issues, so that the mechanisms can be fully functional when the Kyoto Protocol enters into force.

Consumption, climate change, and campaigning

The consumption of fossil fuel is the main cause of the greenhouse effect, and of the increase of the average global temperature, more erratic climate patterns, possibly enhanced ‘El Niño events’, sea-level rises, and more. The implications of all this are very significant for the most vulnerable people living in the deltas of poor countries, in areas prone to drought and flood; but most fossil fuels are consumed by other nations. Furthermore, the high-consumers of the world must also take responsibility for the destruction of forests, the expulsion of original land-users and owners from wildlife parks, the deprivation that follows the construction of dams and reservoirs for electricity generation, and the devastating impacts of mining. The fact that high consumption is also

responsible for those local environmental changes is not obvious to all, and it is less dramatic if viewed from a global perspective, but the changes are no less significant for developing countries and poor people. High-consumers are implicated in deforestation and the destructive effects of mining, dam building, and wildlife parks through their engagement in markets, the operation of their transport systems, their financial investments, and – above all – by virtue of their strong influence over policies that govern the mechanisms that drive environmental degradation. Their ‘ecological footprint’ is enormous.⁶⁰ High-consumers can be found primarily in industrialised nations, but the middle classes in developing countries have similar consumption patterns, and their numbers are rising, especially in cities.

Campaigns to reduce environmental degradation include the initiatives in developing countries mentioned in the previous section (concerning dams, extractive industries, nature parks, etc.) and also campaigns to reduce (fuel) consumption and protests against the expansion of road networks in highly industrialised countries. In all those campaigns, local concerns are central, and the international dimensions and global implications of consumption are not the only grounds for social action. This is understandable; indeed, whatever vice is addressed, over-consumption is often responsible for a combination of local and global environmental impacts. Deforestation enhances the greenhouse effect, because it removes a carbon sink, increases the risk of soil erosion and river flooding, and destroys traditional forest-based livelihoods. New motorways may be planned to go through ‘sites of special scientific interest’ or residential areas, in particular in poorer neighbourhoods. Local concerns about the health risks created by traffic and industrial air pollution are likely to cause more civic action in Southern and Northern cities than does the ‘hole’ in the atmospheric ozone layer over the South Pole (which allows harmful radiation to reach the surface of the Earth). Furthermore, some causes of global climate change (with its local effects) are very unlikely to be taken up by local campaigns at all. The greenhouse effect is enhanced by methane gases in the atmosphere, emitted from ruminants and issuing from paddy cultivation, which are both increasing as people in poorer countries ‘move up the consumption ladder’ (i.e. eat more meat and replace grains and roots such as cassava with rice). There are no reports of demonstrations against increasing cattle herds and paddy fields by campaigners concerned about global climate change!

A recent research project has produced ‘ten suggestions for policy makers’ addressing climate change, some of which reflect also the importance of local issues and the importance of changes in other ‘capitals’ (see chapter 3), as summarised below. This still means that the problem of climate change and the mechanisms that cause it should be addressed by lobbyists intent on influencing global policies that affect climate change; in fact, they might use

the suggestions below in their engagements with influential people and organisations. Central to negotiations about climate are of course the governments of the high consumers – the G8 (i.e. the G7 plus Russia), and also China, India, Brazil and other large, industrialising, and middle-income countries. Furthermore, the World Bank, which manages the Global Environmental Facility (GEF), UNEP, and the Intergovernmental Panel on Climatic Change (IPCC, set up by the World Meteorological Organisation and UNEP) are important actors too. The strongest opposition to reductions comes from the obvious sources: oil-producing countries and companies.

Ten suggestions for policy makers concerned about climate change⁶¹

1. View the issue of climate change holistically, not just as a matter of reducing harmful emissions.
 2. Recognise that, for policy making on climatic issues, institutional limits to global sustainability are at least as important as environmental limits.
 3. Prepare for the likelihood that social, economic, and technological change will be more rapid and have greater direct impacts on human populations than climate change.
 4. Recognise the limits of rational planning.
 5. Employ the full range of analytic perspectives and aids to decision-making from the natural and social sciences and humanities.
 6. Design policy instruments for real-world conditions, rather than trying to make the world conform to a particular policy model.
 7. Incorporate concerns about climate change into other more immediate issues, such as employment, defence, economic development, and public health.
 8. Take a regional and local approach to climate-policy making and implementation.
 9. Invest resources in identifying vulnerability and promoting resilience, especially where the impacts will be largest.
 10. Use a pluralistic approach to decision-making.
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5.3.3 Macro-economic policies

Economic liberalisation, mounting national debts, and economic structural adjustment programmes (SAPs) are all part of a wider process of so-called modernisation and globalisation, and are possibly most notable for the gradual loss of national sovereignty in economic and political affairs. Large

and rich countries are dominant, of course, in bilateral relations and also in multinational structures and development banks; nevertheless, they are also part of these unstoppable trends. The main structures that have been created for the regulation of and co-operation in the globalising economy (i.e. the IMF, World Bank, and WTO) were set up when some of the driving forces of globalisation were not yet known about, such as present-day information technology.

This book does not set itself the task of unravelling all the strands of the economic change-processes, and in fact there are so many links between them that it is extremely difficult to assess their environmental effects. It is, for example, a very complex task to assess the environmental impacts of economic adjustment programmes and separate those from the impacts of the 'Uruguay Round' of world trade negotiations.⁶² However, we do need to consider what effects are possible and have been observed in poor people's livelihoods and environments.

Impacts of Structural Adjustment

Stabilisation and Structural Adjustment Programmes (SAPs) are probably the most wide-ranging expressions of economic liberalisation and modernisation: they promote the principle of 'balancing the books', but also advocate liberalising trade, stimulating exports, and prioritising debt repayment and reduction. More generally they stimulate countries to sign up to mainstream global treaties and conventions. Impacts on livelihoods and environments are clearly not simple or straightforwardly good or bad; they differ from case to case and are highly context-specific. Possible (observed) impacts may be summarised as follows.⁶³

- The impact of devaluation may be higher producer prices, increased costs of imported production inputs (such as fertiliser), expansion or reduction of cultivation in ecologically fragile areas, increased use of local resources for soil fertility, or increased soil-nutrient mining. Higher farm returns (from higher producer-prices and increased exports) may result in farmers' investments in land, such as soil and water conservation measures.
- Impacts of price and trade liberalisation may include higher product-prices, in particular for cash (export) crops, but may also include (initial) failure in marketing, increased costs of imported inputs, and an increase in livestock keeping.
- Cuts in public expenditure can lead to a reduced ability to manage forests, reduced research in (sustainable) agriculture, reduced agricultural extension, and less investment in (urban) flood control and (rural) soil and water conservation.

- Impacts on employment can be positive, in particular if land-tenure relations allow urban to rural migration, following higher producer-prices; however, inequality may also increase in response to cuts in expenditure and privatisation, because only the large (rural) producers can maintain the import of production inputs, and because social services (which are particularly important for the most vulnerable people) will inevitably deteriorate.
- Intensification of agriculture can mean more cash-crop cultivation (displacing food crops), and – despite increasingly expensive imported inputs – it can lead to greater use of agro-chemicals. However, increased use of local organic materials is also a possible effect. Farmers may diversify, but adjustment policies usually encourage a focus on a narrow range of cash-crops. Because of improved agricultural terms of trade, migration from towns to rural areas may occur.
- Debt can be an incentive for unconsidered, exploitative mining, deforestation and fishing, strong support for uncontrolled (and polluting) industrial development, and for export-oriented 'high-chemical-input' agriculture in order to earn foreign exchange at the lowest possible expense. Debt reduction or rescheduling may therefore reduce these pressures.
- Aid money is just a very small fraction of international financial transfers. Finance and trade are dominated by banks and transnational corporations (TNCs) from OECD countries which own patents on technologies and on genetic materials. The products of these technologies (such as genetically modified crops) and the technologies themselves are difficult for the South to acquire, but may be essential for countries that are trying to pursue more sustainable development paths, if they are applied in ways that support livelihoods and environmental quality, instead of merely boosting the profits of TNCs.

Obviously macro-economic policies can have significant impacts, either positive or negative, on environmental quality and local livelihoods, depending on the situation. A group of NGOs assessed the impacts of adjustment and stabilisation policies on Nicaragua, in particular on the viability of peasant agriculture and basic-grain production.⁶⁴ It was concluded that the combined impacts of price and tariff policies affected agricultural goods strongly, putting producers in a highly unfavourable position with respect to international markets. Peasant labour was exploited as a result of credit restrictions, and weak marketing systems were seen as limiting the livelihood development of rural women especially. The report calls for price controls, especially with regards to basic grains; better rural infrastructure (storage, transport) in order to access local, regional, and international markets; and an improved credit-delivery system.

Conditionality, SAPs, and trade

An important issue in all international relations and negotiations, and certainly where structural adjustment programmes are concerned, is 'conditionality'. Richer, larger, and more powerful nations can demand that certain conditions are met before other countries are granted a place at the table, let alone before they can benefit from preferential trade agreements, aid, or debt-relief and restructuring packages. 'Green conditionality' has appeared too and in some cases has been likened to 'green imperialism', in particular in the context of North–South relations. Most environmental regulations are stronger in the richer countries; this has been construed as an argument for saying that environmentalism is a rich-country luxury and a new way of keeping developing countries poor and backward. Of course the main reason for comparatively strong regulation in the North is that environmental risks are so much higher, with high degrees of industrialisation and resource consumption, and extensive transport systems based on fossil fuels.

The differences over environmental regulation between North and South lead to controversy in trade negotiations, in which there is a risk for developing countries that the markets of rich nations will be closed to them if they do not follow the environmental (and social) standards of the rich nations. Why would Malaysia (for example) refrain from using or selling all the trees from its natural forests, when Great Britain did the same thing a two–three hundred years ago? Why would any newly industrialising country adhere to the current pollution standards of the USA, a nation that was polluting its own soils and waters most harmfully just a few decades ago? For answers to such questions, one needs to look first at the needs, environments, and livelihoods of the populations of Malaysia and other developing countries, and the interests of their children. It is obvious that pollution and large-scale deforestation are not usually in their interests, nor in the interest of the national economy. (This becomes visible if environmental externalities are properly accounted for.) However, financial resources to invest in the latest and 'cleanest' technology are also limited, and some sort of compromise between short-term production gains and longer-term economic and environmental sustainability will need to be found. The international community can help, for example by finding ways to make the latest technology available to developing countries.

Northern environmental standards were not set objectively: they are the outcome of political choices made by the people and governments concerned, even though discussion and decision will always be based on some scientific evidence. Standards for acceptable pollution of surface water, for example, change continuously in response to new scientific evidence of the effects on health, the election of new governments, and changed economic conditions. Also, the standards need enforcing, and this can happen only with local

political support. Where ethical, environmental, and health issues are of concern to consumers, it is reasonable to expect that their voice is heard and that production conditions are explained on mandatory labels (as in 'fair' or 'ethical' trade). However, labelling can be seen as one of many restrictions on import, and exporting countries do not want importers to dictate how they should produce their goods. A famous case where import restrictions were not allowed on environmental and ethical grounds under GATT rules is the US ban on imports of tuna from Mexico, where tuna fishing was harmful to dolphins. The US ban implied an extension of the jurisdiction of a country beyond its borders, and it was not allowed by the global trade regulators.⁶⁵ The same type of dilemma dominated the 'shrimp-turtle case', where the WTO ruled that the USA cannot ban imports of shrimps caught with techniques that harm migratory sea turtles, following a challenge from exporting countries, including India, Malaysia, and Thailand. This case also showed several flaws in the legal capacity of the WTO to rule on environmental matters.⁶⁶

Trade policies, biotechnology, and biodiversity

Trade-related international policies and policy-making processes have very strong implications for food security and biodiversity, as the following shows.⁶⁷

The USA and the EU now have policies in place that make both plants and plant-breeding processes patentable, although the EU directive still meets opposition in some of the member countries, who are all expected to incorporate it in their national legislation. Biotechnological processes (i.e. technologies) and their products (i.e. genetically modified, or GM, crops) must be novel, inventive (not a discovery), and capable of industrial application in order to be eligible for patenting. An example from the USA is the grant to W.G. Grace & Co. and Monsanto of a patent on *neem* products, with applications for use as pesticides and also in human health – despite the fact that the *neem* tree and its many products and applications have been publicly known for centuries in India. The standard criteria for patenting (especially those of novelty and invention) were obviously not applied.

Not all countries have well-developed patenting systems, and few have included life-forms as patentable (notably the USA, Japan, and European countries). The existence of a patent in a country has implications for trade with others, even though the patent applies only to that country. For example, when the harvest of a particular crop (variety) is traded with a country that recognises a patent (i.e. private rights) on its genetic make-up, the patent holder can claim royalties or import restrictions, even though the patent is not legally enforceable in the country where the crop was grown. This became a real threat in the case of the export of harvests of the staple food quinoa in Bolivia, when US researchers effectively patented (in the USA) the Apalawa variety and indirectly other traditional varieties.

The agreement on Trade Related Intellectual Property Rights (TRIPS) is incorporated in the WTO regulations: its article 27.3b requires all countries to 'provide for the protection of plant varieties either by patents or by an effective *sui generis* system'. *Sui generis* refers to a system that at least regulates intellectual property rights in some way. There are opportunities for developing effective systems that do not demand full patenting, but they are complex and costly, and will effectively have to be endorsed by the international community. The text is thus very ambiguous and will be renegotiated (which may result in more flexibility for developing countries, or force them to edge closer to including life-forms in national patent systems). With most industrialised countries now in agreement over the patenting of life forms, the opposition from the rest of the world will have to be very strong indeed to protect local biodiversity, farmers' rights to save and re-use seeds, and traditional processes to extract plant properties. The Indian government and particularly Indian activists are in the forefront of the opposition to protect the livelihoods of small farmers, together with farmers themselves. The existing TRIPS agreement must be implemented in developing countries by 2000, or 2006 for the least-developed countries.

The UPOV Convention on Plant Breeders' Rights was agreed in 1991 and many countries had signed up for it by 1999. UPOV is a system that could be the '*sui generis*' system that is required under the TRIPS agreement of the WTO. It allows individual entities (which means in practice large farms and seed companies) to claim rights over the crop varieties that they breed from older varieties. Unlike patenting systems, UPOV does not allow claims of intellectual rights over the processes or techniques to create new varieties, i.e. traditional breeding or modern biotechnological processes. However, this is not a mechanism that can protect farmers' seed-saving rights; nor does it recognise the efforts of generations of farmers in selecting and breeding crop varieties, because registration requires crop varieties to be distinct, uniform, and stable, which traditional varieties generally are not. This system of regulating breeders' rights (and patenting even more so) effectively enables those who manage to alter two or three genes out of the thousands of genes of a particular crop species to claim rights over that variety's seeds and the off-spring of the seeds.

The WTO-TRIPS agreement and the Convention on Biodiversity (CBD) are both signed by most countries of the world and are both legally binding, but they conflict with each other, and neither is very clear. The CBD, finalised in December 1993, is a legally binding treaty to stop the destruction of biological diversity and to protect species; it established guidelines for the sharing of research, information, profits, and technology in genetic research. However, it has not been signed by all interested governments, and most notably the US (Senate) has so far opposed it. The CBD promotes the sharing

of benefits of genetic resources, but TRIPS promotes their commercialisation and privatisation. Calls to strengthen the CBD cite various cases of 'bio-piracy'. Bio-prospecting is mostly carried out for the pharmaceutical industry, but it is expected to play an important role in the research and development of genetically modified (GM) crops and plants.

The International Undertaking on Plant Genetic Resources (IU) stresses national sovereignty over the 'common heritage' of seeds and plants, in line with the CBD, and aims to preserve, collect, and make plant species widely available for breeding and other purposes. Current negotiations are seen as a key opportunity to gain sufficient guarantees for farmers' rights, in particular if the EU supports African nations and many other developing countries in accepting the IU as a legally binding protocol under the CBD. By late 1999 the IU was still a non-binding agreement, and some important countries had not signed it, including the USA, Japan, Brazil, China, and Malaysia.⁶⁸

The parties to the CBD are negotiating a so-called Bio-safety Protocol, aiming at the safe transfer, handling, and use of living modified organisms, and focusing on trans-boundary movement. Many NGOs argue that a global moratorium on commercial releases of GM crops and trade in their products is needed until the risks are properly known, and issues of liability and also intellectual property rights have been agreed. They would welcome a Bio-safety Protocol that covered issues of liability and compensation for the calamities that can result from the transport and release of GM crops. Negotiations stalled in 1999, but appeared to reach a reasonable compromise in early 2000.⁶⁹ The Food and Agriculture Organisation (FAO) plays an important role as co-ordinator of some of these discussions, partly because of its technical expertise, and also because it controls the so-called gene-banks of the international agricultural research centres of the CGIAR system.⁷⁰

Trade and agriculture

The WTO's Agreement on Agriculture (AoA), signed in 1994 at the Uruguay Round, is currently being reviewed. It commits signatories to a substantial reduction in the protection of domestic agriculture, with some safeguards for developing countries. Industrialised countries are expected to reduce export subsidies, other financial support for agricultural products, and tariffs on imports more rapidly than developing countries, in six instead of ten years from 1995.⁷¹ However, the levels of subsidies and support for agriculture and farmers by the rich countries were and are likely to remain substantially higher than what most other countries are or would be capable of, leaving them with tariffs as the main way to protect their farmers and food markets. But tariffs must be reduced, according to the agreement.⁷² High levels of subsidies in the EU and the USA lead to artificially low world-market prices and effectively to dumping of their surplus production. This creates a very

'uneven playing field' for Third World farmers, who already have difficulty in competing, because they produce with lower educational levels, less investment capacity, and less-developed extension services, and they trade through less-developed infrastructure and with fewer services.

The safeguards in the AoA for developing countries include the proviso that reform from 1999 should take into account trade and non-trade concerns, and should consider the initial impacts of the AoA on employment, livelihood opportunities, and the national balance of payment. The impacts on world trade and non-trade concerns are of course very difficult to assess, but calls for in-depth research have so far met with only a limited response by the WTO and the rich nations, even though the new round of negotiations is underway (despite setbacks in starting up the negotiations in Seattle in 1999, which were disrupted by vigorous popular protests, and where developing countries voiced strong criticism of the dominance of the USA and EU).

The AoA is expected to have a particular impact on the prices of certain commodities, on world-market price stability, and on the food-import bills of the Least Developed Countries (LDCs) and Net Food Importing Developing Countries (NFIDCs).⁷³ Initial analysis suggests the following:

- Prices of commodities such as cereals and meat rose as a result of the AoA, in particular because of a reduction of subsidies in the EU and USA, but a reduction of world-market prices from 1996 till late 1999 (and further downward pressures) suggests that this impact may have been temporary and that other factors may be more important.
- The expectation of greater stability in world-market prices has been questioned, in particular in the short term, for example because of the potentially destabilising effects of reduction of government stocks following liberalisation. The few data from the short period since implementation of the AoA are insufficient to draw any conclusions in this regard.
- The effects on the food-importation bills of developing countries have been negative. Because of their continuing debt burden, these countries are rendered more vulnerable to sudden calamities such as drought that would result in steeply increased food bills. The LDCs and NFIDCs have depended heavily on concessional food sales and food aid; since 1994 they have been paying higher food prices, and their import volumes have risen. The rise in their average food bill is thus largely attributed to a reduction in food aid, which in turn relates to a (gradual) reduction in over-production, following reductions in agricultural subsidies in rich food-exporting countries. A significant problem is the fact that producers in LDCs and most NFIDCs operate under such disadvantaged circumstances that world-market prices do not translate into effective production incentives.

The AoA allows domestic support measures that have no direct impact on production and are not seen as support measures that distort trade, for example government payments for environmental protection, regional assistance, and training and research programmes. Other domestic support measures that are exempted under the AoA include agricultural input subsidies to low-income producers. These exemptions are (almost) all based on government payments, i.e. subsidies to the agriculture-plus sector, and are less achievable for developing countries, because of a lack of financial resources,⁷⁴ although in some developing economies they have been shown to be important. For example, analysis of the impacts of agricultural extension activities and government policies on extremely poor farmers in a remote area in Vietnam showed that even some of the very poorest families within those communities managed to increase productivity and income over the period 1994–1998 (but the increases were smaller than the achievements of the better-off farmers). This was attributed to a number of government policies and measures, in particular to modest subsidisation of hybrid seeds, fertilisers, and livestock medicines (see also section 3.1).⁷⁵

Some activists come close to the position of rejecting altogether the trade policies on food and agriculture as promoted by the WTO. They want policies that aim for national food self-sufficiency and exclusively local food production and consumption chains. In order to safeguard the interests of developing countries and poor women and men farmers and consumers, most lobbyists aim more realistically for amendments. They argue for strengthening of the CBD, a greater role for developing countries in international negotiations, and additional international agreements. Amendments and additions to the AoA should concern in particular the conditions under which domestic support for farming can be provided, in order to strengthen local food systems (including production) and environmental quality.

Lobbying of the main players in international negotiations usually takes place on the basis of analysis of global processes, of detailed information collection, and with case studies of developments in particular countries. An example of this concerns the links between farm subsidies in the industrialised world, global trade rules, and the predicament of farmers and consumers in the Philippines and Mexico.⁷⁶ It has been concluded that the WTO and regional trade associations should 'allow developing countries to protect their food systems up to the point of food self-sufficiency for social, ecological and economic reasons', and that the USA and EU should end agricultural subsidies and the dumping of surpluses. Some international campaigning efforts are carried in part by grassroots action. In the case of GM crops and patenting of life-forms, farmers in India play a key role, with

their vocal leaders. A large part of the people's movement in India has adopted Gandhian tactics of non-violent civil disobedience and campaigns for self-reliance, despite instances of State violence (see also chapter 2). Hundreds of heavily indebted farmers committed suicide after the failure of harvests of hybrid cotton that proved to have little resistance to pests and drought. This tragedy created an important impetus for protests against Monsanto, national patent laws, and WTO policies, and received broad international media coverage.

Sometimes international campaigns focus on just one particular regional case, in order to address an urgent problem. An example of that is the preferential banana trade from Caribbean island States to Europe. These countries and their farmers are extremely dependent on the trade with Europe, but are relatively uncompetitive compared with large US-based corporations with plantations in Central America and elsewhere. The former British and French colonies were allowed quotas for export to Europe for a certain period of time (allowing for gradual diversification and to make investments to improve productivity and competitiveness), and US corporations complained of being excluded from a large market. This preferential treatment of some former colonies developed into a serious dispute between the USA and the EU. The WTO ultimately decided that the USA was justified in imposing retaliatory trade sanctions on exports from the EU of wholly unrelated products, in respect of forgone trade in bananas that are not even grown in the USA.

Oxfam and several other international NGOs have supported Caribbean NGOs and States in their efforts to convince the EU of the validity of their cause, and they made initially good progress. Work to develop alternative trade in coffee from those and similar countries has also been on-going for some years, and channels for fairly traded bananas have been opened up too. This is based on collaboration between national producers' groups and fair-trade organisations in several European countries, including Max Havelaar in the Netherlands and the Oxfam Fair Trade Company in the UK. Fair trade aims to by-pass the 'middlemen' and pay fairer prices directly to producers, and also to ensure decent working conditions and environment-friendly production. Fairly traded coffee has achieved a significant market share in several European countries, and in the case of bananas there is hope that some of the problems of Caribbean farmers caused by the decision of the WTO will be alleviated.⁷⁷ Many 'fair traders' have also taken steps to ensure that their food products are GM-free, and in many cases they are organically grown – with benefits for consumers, producers, and environments.

Epilogue

The global environmental changes and macro-economic policies discussed in the last section of this chapter are often beyond the immediate experience of poor and excluded people, and also beyond the interests of development professionals who work to reduce poverty. That does not make the global environmental changes less pertinent, or the macro-policies that influence them less important.

The sustainable livelihoods framework suggests that macro-policies and structures of governance can influence the trends and shocks to which poor people are particularly vulnerable. The less-natural disasters such as droughts and floods appear to increase in unpredictability and severity with climate change, which is at least partly the result of human action. Human action can by definition be influenced by policy. For example, airline fuel could be taxed, which would limit excessive air travel and false competition with other modes of transport, and would help society to take responsibility for economic externalities borne by the environment. There are macro policies that can influence all kinds of global or regional trends and shocks. All of these policies are primarily made by national governments, and sometimes in international forums, such as the World Trade Organisation.

There is ample evidence to show that poor and excluded people can influence policies of their governments and the multilateral agencies created by them. Marginalised people do not generally want to influence policies for the sake of the global environment, but rather because they want to protect and improve their own livelihood opportunities and local environments. However, the power and agency of social classes or 'target groups' is generally limited: they are not usually social actors. Poor and excluded people need representatives and the support of agencies and organisations that have an interest in helping them to improve their situation and that have (or can generate) influence.

The effects of the policies of governments and large enterprises on local environments and livelihoods must be understood, and warnings must be issued as soon as the indications are negative. Public policies can also support livelihood strategies; they can stimulate regeneration of natural capital, or they can for example help to enhance awareness of environmental change (that is, they can help to build up knowledge and human capital). Nevertheless, poor people themselves are the main resource and the main force for improvement of their livelihoods and environments.

People are their own human capital; they decide their own livelihood strategies; they invest their time and their savings in physical, social, and natural capitals. They bring up their children and provide them with

education, and thus reproduce life and society. That completely obvious truth is also the main reason why people – and certainly poor and marginalised people – will generally be a force for environmental conservation.

This book has attempted to explain some of the complexity of livelihoods, the relationships between poverty and environmental change, and some of the variety of responses of deprived people to environmental challenges. It set out to explore the reasons why environments are important in poverty alleviation, and also to offer some guidance to development professionals in helping people to improve both their livelihoods and their environments. I hope that its contents will prove to be of value.