

RURAL POVERTY ALLEVIATION

(PART-I)

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Compiled by:

Dr. Nowshad Khan
Department of Agricultural Sciences
Allama Iqbal Open University
Islamabad.

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Allama Iqbal Open University
Islamabad

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CHAPTER 1

INTRODUCTION AND OVERVIEW

This Report examines the constraints faced by the extremely poor – some 1.2 billion of them – and the opportunities they have to escape from poverty in the near future.

The focus is on the rural poor, who constitute the bulk of the poor. The Report examines the potential of smallholder production and water conservation in agriculture, of existing and recent technologies, and the roles of small producers, markets and institutions in providing opportunities to the poor. It builds on the argument that, with appropriate and focused support for enhancing the productive potential of the poor in a pro-poor environment, the poor can help themselves to escape from poverty. Growth and distribution are essential for poverty reduction. But sustained poverty reduction also requires pro-poor institutions and the building of partnerships between the rural poor and other stakeholders.

Globally, 1.2 billion people are in 'extreme consumption poverty'. More than two thirds of them are in Asia; South Asia alone accounts for nearly half of them. About one fourth is in sub-Saharan Africa. Three quarters of the poor work and live in rural areas; significantly more than a half are expected to do so in 2025.

The 1995 Social Summit in Copenhagen agreed that each member should devise a programme to reduce extreme poverty, monitor and measure progress against some agreed targets and adjust policy accordingly. Subsequently, the member states in the twenty fourth special session of the General Assembly of the United Nations in June 2000 committed themselves to halve extreme poverty by 2015. This put each developing country in the 'driver's seat'. In 1996 the aid donors agreed in the Organisation of Economic Co-operation and Development (OECD) to restructure aid to sup-

port monitored progress towards poverty-reduction targets. The World Bank, the United Nations Development Programme, the Development Assistance Committee (DAC) of the OECD have all placed emphasis on taking concerted action and reducing poverty at an accelerated rate to achieve the global target of halving poverty by 2015.

Progress with poverty reduction in the last decade has been slow. The rate of poverty reduction in 1990-98 was less than one third of what is needed to halve extreme poverty during 1990-2015. It was six times less in sub-Saharan Africa. The real value of aid fell sharply between 1987-88 and 1997-98. The share of aid going to low-income or least-developed countries, which contain over 85% of the poor, stayed around 63%, and agricultural aid collapsed. The rural sector has largely remained neglected, despite its great concentration of poor people.

POVERTY AND ITS RURAL DIMENSION

The ill-being caused by poverty has many dimensions. Low consumption is only one such dimension, but it is linked to others: malnutrition, illiteracy, low life expectancy, insecurity, powerlessness and low self-esteem. Poverty is also linked to frustrated capabilities due to asset deprivation, inability to afford decent health and education and lack of power.

Poverty can co-exist with rather high levels of income, widespread infrastructure development, technological achievements and urbanization – in Latin America, the United States, and South Africa, for example. The institutional environment in which the poor derive their livelihoods, and the socio-political factors that restrict their access to resources, can influence the relationship between economic growth and the level and the extent of poverty.

Countries use different, often non-comparable, national consumption poverty lines and rural-urban borderlines. There are serious measurement problems of poverty, which has to be linked to other non-consumption-based indicators and to self-assessment to allow comparisons.

However we treat such measurement problems, the proportion of the poor making their living in

rural areas has remained, and is expected to remain, strikingly high. And over half the world's extreme poor depend for their livelihoods mainly on farming or farm labour. The rural poor's welfare, of course, depends on many aspects of public action other than direct investment in support of agriculture – on schools, clinics and civil order – and on private as well as public action. Nevertheless, poverty reduction does depend, in part, on an adequate share of agricultural investment support within the portions of public spending and international aid that can be allocated among economic sectors.

Yet the absolute value of aid to agriculture fell by two thirds in 1987-98, and its share in aid that can be allocated to particular sectors halved. In key low-income countries where the poor are concentrated, agriculture's share in sectorally allocable investment, and aid, is far less than in Gross Domestic Product (GDP), let alone employment. Moreover, though price biases against agriculture have shrunk since 1980 (with ambiguous effects on the rural poor as food prices rise alongside job prospects), the slighting of agriculture and the rural sector in public investment and aid spending has increased.

Effective poverty reduction therefore requires resources to be reallocated to the rural and the

Box 1.1: Why focus on rural poverty?

Big rural-urban gaps in income, poverty, nutrition, health and education are not shrinking; through 2020 most of the dollar-poor will be rural.

Though rural poverty fell sharply in 1970-85, the decline has slowed; it bypassed countries, ethnic and other groups, and whole regions and agro-ecologies.

Addressing rural poverty raises food supply and may reduce migration, thus helping reduce urban poverty. Also, successful rural poverty reduction usually works by raising the productivity of the poor; but most treatments of urban poverty are welfare-oriented, often depending mainly on upgraded housing.

Poverty reduction and asset equalization, especially in rural areas, assist growth.

Ongoing big rises in worker/child ratios provide a 'window of opportunity' for poverty reduction. To that end, the rural poor need to share much more in female empowerment, and better health and education that permit fertility decline, and in research, investment and employment for the working poor.

Yet aid, even more than public investment, goes disproportionately to countries – and increasingly to non-rural sectors – where most of the poor do not live or work.

poor. But a focus on rural poverty reduction need not imply a neglect of economic growth; indeed, it can speed up economic growth (Box 1.1). It is inefficient to exclude people from schooling or managing productive assets because they are too poor to borrow; or because they are born in villages and hence lack urban facilities; or because they suffer from other forms of exclusion – upland, dryland or remote residence. Yet the rural poor suffer an inefficiently low share of schools, health care, roads, land, technology, research, and institutional and market access.

RURAL POVERTY REDUCTION: THE CONCEPTUAL FRAMEWORK

Poverty is multidimensional; therefore, poverty reduction efforts have to be multi-targeted and are expected to show wide and diverse dimensions. The solutions have to straddle different disciplines and must encompass economic, social, political and institutional factors.

Notwithstanding such diversity, four aspects are of critical importance for understanding the challenges facing rural poverty reduction.

First, institutions, markets, technology policy and asset arrangements need to reflect the critical role of food staples in the livelihoods of the rural poor. Most rural households build up livelihoods from several sources; and some very poor rural areas grow no food staples. Yet staples provide most of the poorest with most work, income, consumption and calories. Those in extreme poverty usually get 70-80% of calories from staples, which also absorb most of their working time. While a rising proportion of the rural poor rely for income mainly on livestock, cash crops or non-farm activity, in early development staples farming or employment provides most of their income.

This is not to deny the importance of the growth of the non-staples sector for rural poverty reduction, nor to indicate only a subsistence path of development. The non-staples sector (production

of cash crops and other food crops, and small-scale non-farm production) is important and will become increasingly so. In fact, widening market access and liberalization increasingly allow rural people to escape poverty through non-staples production and exchange. In this process non-farm assets and skills are critical, as are infrastructure and institutions to help small units to maintain market access during globalization.

Second, rural poverty reduction increasingly requires better allocation and distribution of water. The tightening squeeze on rural water supply demands both priority for the poor and more efficient water use. Rice and horticulture create much employment income for the poor, but are heavy users of water. Many drylands already suffer from severe water stress. Groundwater tables are falling, and surface water may become scarcer due to climate change. There is also heavy pressure to divert water to urban areas and industrial uses. Securing the more efficient water use needed to increase staples output will be difficult. Increasing the availability, quality and efficiency of farm water for the rural poor is a major challenge.

Third, feasible growth alone, even in the rural sector, will in many countries not suffice to halve dollar poverty by 2015. In some very poor countries, too many people are too deeply poor. In some middle-income countries, initial inequality is too great. In such cases, achieving the poverty target requires redistributive empowerment of the rural poor through higher shares, access and control of appropriate assets, institutions, technologies and markets. Usually that is good for growth, as well as equitable.

Fourth, particular groups – especially women – and methods – especially participatory and decentralized ones – merit special attention. Redressing disadvantage for women, ethnic minorities, hill people and semi-arid residents helps the efficient use of anti-poverty resources – schools, land, water – as well as fairness. Women especially need direct

influence over resources and policies. Participatory and decentralized management, apart from securing democratic control and developing human potential, often improves the cost-effectiveness of a range of actions, from developing new seed varieties through microfinance to rural schools and public works programmes. Special measures are needed to enable the poor to participate.

Creating productive employment opportunities for the rural poor

Underlying all four themes is the fact that rural poverty reduction generally benefits from labour-intensive approaches. Labour-intensive development economizes on capital and/or land. Capital is always scarce in low-income countries, and land is scarce in more and more of them. Developing countries, with high ratios of labour to capital, also gain more from market liberalization if they encourage labour-intensive production lines – as is induced by world-market incentives. Employment-intensive policies, technologies and institutions usually help both economic growth and poverty reduction, since it is the poor who have mainly labour to supply. Thus, subsidies to labour-displacing tractors cannot normally be justified. Smaller farms and rural production tend to use more labour and less equipment than larger units.

The primacy of agriculture in development

As people become better off, their demand for food, as a proportion of income, falls, as reflected in the steady fall in the relative world price of farm products. Might this impede feasible agricultural expansion, and thus justify low public investment and aid for agriculture?

In early development, while mass poverty exists, poor and underfed smallholders (and their even poorer employees) use much of their extra income to obtain and consume their own and their neighbours' extra farm produce – provided public investment and aid supports, increased food pro-

duction by the poor. Then, there is much less of a demand problem. What remains can be overcome, if, as in the Green Revolution, technical progress in seeds, infrastructure and water management on small private farms raises productivity faster than prices fall, leaving farmers, farm workers and food buyers all less poor.

In later development, extra public investment can underpin the infrastructures needed for small-scale and labour-intensive food production, partly traded and partly used to diversify and enrich the diets and employment of poor producers. In both phases rural non-farm growth contributes a rising share of rural incomes, but depends substantially on consumer demand based on small-holder prosperity.

Four themes

This Report explores four themes: access to assets (physical and financial), technology and natural resources for rural poverty reduction, markets for the rural poor, and institutions for the rural poor. This does not mean that other issues, such as the security and vulnerability, and the ownership and agency, of the poor are less important. These issues have been discussed in depth in various forums in recent months. Rather, this Report focuses on aspects of poverty reduction that are critical but often neglected. It concentrates very heavily on concrete production and income issues, and on agriculture. But the answer to rural poverty is not just agriculture, although this is a big part of the story. Agricultural change can work to reduce poverty, but only when linked to social changes that give the poor greater power over the social factors that shape, and far too often circumscribe, the horizons of their possibilities, including their agricultural options and assets.

ASSETS AND RURAL POVERTY REDUCTION

Assets empower the rural poor by increasing their incomes, reserves against shocks, and choices to

escape from harsh or exploitative conditions ('exit options'). The poor can directly control assets by ownership, rent or communal tenure, or indirectly gain from assets, whoever controls them: through employment, for example. Urban-rural and rich-poor gaps in asset ownership exceed greatly the corresponding gaps in income and consumption, making the rural poor especially dependent on their labour-power. Assets most help rural poverty reduction when they are employment-intensive, divisible into small low-cost units, and low-risk.

For many important assets, gender bias doubly harms the poor: as a source of injustice to children and women, and as a source of inefficiency and slow growth. Feasible remedies are indicated.

There are strong complementarities among asset types. The poor (and economic growth) do better with some improvement in health, nutrition and schooling than with a lot of one and none of the others. Such human assets do more for a poor person if he/she also has some farm or non-farm assets and his/her productivity is rising. Previous education helps a poor person to get better returns from irrigation.

Landreform: back on the agenda

An important element in the quest for greater access to assets is land redistribution. Extreme land inequality is bad for growth, and steers its benefits away from the rural poor. Most of the rural poor depend on farm income, yet usually control little farmland. Land reform to create small, not-too-unequal family farms is often cost-effective in reducing beneficiary poverty. It also helps hired farmworkers; small farms employ more people per hectare than do large farms, and small farmers and their employees spend more of their incomes on employment-intensive rural non-farm products.

To escape poverty sustainably, post-reform farmers need appropriate infrastructure and serv-

ices; these needs are likely to change with liberalization and globalization. It is important to draw distinctions between confiscatory, statist or top-down approaches and the 'new-wave land reform': decentralized, market-friendly, with support from and involvement of civil-society action and with consensus.

Imposition of modes of tenure can 'go against the grain of preference or efficiency. Both communal land tenure and private tenancy can be pro-poor; restricting them is usually counter-productive. Furthermore, exclusive emphasis on land asset control by households misses the problem that many households, laws and customs discriminate against women, thus damaging efficiency, equity, child health and poverty reduction.

Poverty reduction among the rural poor would require increased support, from governments and aid agencies, for farmland redistribution to poor communities, households and women. Extreme land inequality appears to 'fix' social relationships: its impact on overall inequality does not appear to diminish, even after agriculture's role does. Hence land redistribution remains cost-effective against poverty in Latin America and Southern Africa, where some ethnic groups remain in rural poverty, largely due to exceptional inequality of farmland as well as education.

Access to water

Some control by the poor over water is essential if they are to realise the full benefits from farmland. East and South Asia's fast poverty reduction and farm growth owe much to the 30-35% of irrigated cropland - and the persistence of rural poverty and agricultural stagnation in most of sub-Saharan Africa to its mere 1-5%. Water control is also vital for adequate and healthy drinking water and sanitation. Yet the rural and the poor have even less access to water-yielding assets, and hence water control, than to land. Worse, climatic and eco-

conomic developments threaten many rural people – especially the poor – and their food production with growing water stress. Improving this depends partly on redistributing water-yielding assets, and partly on incentives for asset types that save water by using labour. Small, divisible, farmer-controlled water supply systems benefit the poor most, but in some conditions, and with environmental caution, large systems remain essential. In either case, user participation in design, management and maintenance are proven keys to asset efficiency, yet are usually absent.

Special attention to women's water rights is needed. Women and children are also the main losers from distant, inadequate and unhealthy drinking water. Modest but enforced water charges (payable as maintenance labour), complementary water improvement and health care, and managed credit to acquire water-yielding assets are keys to pro-poor and efficient use of increasingly scarce rural water for production or consumption.

Access to other assets and non-farm activities

Livestock in a few areas, and small stock in many, are more than proportionately controlled by the poor. Improving returns from such stock through better marketing, extension, and research, and supporting institutions for small or joint herd control, are necessary.

Rural non-farm activity provides 25-40% of rural income – sometimes more for the poor, sometimes less – and is growing faster than farm income. But its dynamism usually depends on demand from a growing, fairly equal farm sector. So neglecting poor farmers and farmworkers in order to free resources for the non-farm poor is often self-defeating. Further, usually some rural non-farm activities (trade, transport, construction) are dynamic, but other activities (traditional services and crafts) contract as the rural economy develops; the poor are helped much

more by skills and infrastructure for the former than for the latter.

Usually, poor people, who are primarily rural, are deprived of 'human assets' – health, child nutrition, education, skills – and are especially prone to gender biases in their allocation. In the medium term, extra human assets are the most effective, just and growth-inducing ways to advance the rural poor – provided there are also natural or physical assets, or work, yielding more to the educated, in a growing economy.

More (and better) health, education and nutrition normally stimulate each other, are complementary and, if acquired by parents, especially mothers, also benefit children. Usually, provision and quality discriminate heavily – and inefficiently – against rural areas, remote places, ethnic minorities and (in education) women. Such discrimination is most severe among the poor.

Most human assets, notably primary schooling and health care for the poor, must be financed mainly by the public sector. Financial viability and participatory management are real problems. But user fees in primary health and education are not the answer. They have proved almost impossible to target correctly; have saved little public money; and have discouraged use of services by the rural poor and hence growth of their incomes. Other ways to financial viability and participation for human asset provision are feasible.

TECHNOLOGY, NATURAL RESOURCES AND RURAL POVERTY REDUCTION

The importance of technology for rural poverty reduction and recent trends

Technology is central in reducing rural poverty.

In 1965-85, rice, wheat and maize, in much of Asia and Central America, experienced a big technology shift, the 'Green Revolution', that increased yields, enhanced employment and brought about a rapid fall in poverty. But these effects have since slowed.

Technical progress has by-passed hundreds of millions of poor people – many of the remaining hardcore poor – in specific regions (including most of Africa), agro-ecologies (dryland, upland), and products (sorghum, yams, cassava, smallstock).

Water resources in many areas, and land in some areas, face serious threats of depletion and pollution, which appropriate technical change can reduce or reverse.

Recent scientific advances bring new prospects for reigniting and spreading to laggard areas and crops the technical progress that can reduce poverty and conserve resources.

Bio-agricultural technology: old and new

In bio-agricultural research, the goals must be enhanced yield potential (and yield growth) in 'lead' areas and spreading progress to neglected regions and main staples. Both require a sharp reversal of the long fall in levels (and security) of funds for public-sector agricultural research – and of the growing diffusion of such research systems, often at the behest of donors, into matters other than yield enhancement, stabilization and sustainability. Also needed is much more public sector research into transgenic food staples, with traits selected by labour-intensive smallholders. This requires different incentives for scientists – and research – now increasingly locked into a few large science-based companies and directed towards traits, crops, and farmers of little interest to the poor.

The priority for bio-agricultural research is employment-intensive but sustainable yield growth, in a context of improved transformation and recycling of water and nutrients. Land/water technology should aim at outcomes attractive to farmers by links with varieties fertilized for sustainably higher and more profitable yields – not, in most cases, with 'low-external-input' farming, which usually raises the dilemma of whether the land should be used for low outputs or soil mining.

Transgenic crops and animals have triggered justified public demand for open, participatory systems, involving farmers and consumers in scientific decision-procedures that effectively regulate food safety and the environmental impact of introduced varieties, species and foods. To realize the huge potential of transgenics, especially for areas hitherto little affected by research, requires big changes in the criteria and incentives now guiding the allocation, use, and civil-society overview of scientific resources. Public/private, and donor-agency/civil-society, partnership action is urgent, especially for those developing countries that have limited scientific capacity yet are heavily dependent on food staples yield growth. Inaction in agricultural and water technology could undermine all other efforts for rural poverty reduction in coming decades.

Often, especially in West Africa, chemical fertilizers, better germplasm and humus enrichment by natural manures, though presented as rivals, are complements in sustainable small farming. Participatory methods are allies of, not populist alternatives to, formal research, including early-generation plant breeding and even biotechnology.

Pro-poor, sustainable technical progress should seek robustness, stability, yield enhancement and labour-intensity. In moving from such principles to selecting product and method priorities in technology policy, complementarity is desirable, and hence cooperation between research groups and types, including groups of farmers. So is allowing for time-lags: the conditions prevailing when research is planned often differ greatly from those when farmers adopt the resulting innovations – worker/land ratios may be sharply higher, or water-tables lower, for example.

Existing technologies: write them off?

It is certainly premature to write off existing technologies. In many cases, their potential has

not been exhausted and needs to be explored further. In many cases, their potential in breaking the barrier of higher yield and sustainable development is constrained by institutional factors: lack of water and extension and of adequate support services. New technologies are not panaceas for such problems. On the contrary, they remain issues for all forms of technical progress at the small-farm level.

Technologies for land and water management

Improved land management technology is historically slow to spread, or to improve farm income. It is often inadequately integrated with biological research, yet is vital to reduce land depletion. To attract poor farmers, such technology needs to show production returns (such as vegetative erosion barriers usable for fodder, rather than stone bunds), and should employ labour (preferably slack-season) rather than equipment. For these purposes, some forms of conservation tillage and land reclamation have proved far better than others.

Technical choices are crucial to solving the water crisis that increasingly threatens many rural poor people. Agriculture is being pressed in most developing countries to 'use' less water. But 'using' need not mean 'using up'. With appropriate drainage and recycling, significant water saving can be achieved. Employment-intensive ways to improve conveyance and use efficiency of water have proved feasible with proper incentives and user institutions. However, the justified emphasis on farmers' methods of water control and irrigation should not be allowed to distract attention from the need for faster progress in this area with formal, 'frontier' invention and innovation suitable for smallholders.

Despite justified pressure for water economy, in many places more irrigation is needed. Africa's slow progress in agriculture and reducing rural poverty, compared with Asia's, has much to do with lack of water control. Successful adoption of farmer-controlled, very small-scale irrigation has

shown that it can benefit the poor. This should be built on, and progress accelerated. Larger irrigation schemes in Africa have a mixed and often weak record, but some of the difficulties have abated. Major improvement in water availability, timing and management is essential for rapid continent-wide progress against rural poverty. That may require advances in water research and some major irrigation.

Reviving pro-poor technologies

However, reviving pro-poor, resource-conserving agro-technical progress faces problems. The central issue is how the poor can benefit more from recent technological progress. What conditions, circumstances and policies make this possible? How far does the concentration of recent technical progress in private firms, as opposed to the public sector during the Green Revolution, make such technologies less pro-poor? How much progress in land and water management technologies needs to be achieved to complement the progress in new crop varieties? To what extent does current research consider the priorities of the poor, the demands of the complex, diverse, risk-prone dry and hilly farm systems?

Fortunately there is evidence that economic returns on crop research are now higher in some neglected areas than elsewhere. New resources for the public sector, and institutions to shift incentives for the private sector, are crucial, as is participatory priority-setting by and with the rural poor.

MARKETS FOR THE RURAL POOR: EXPOSURE TO THE WINDOWS OF OPPORTUNITY

Most of the rural poor are already substantially involved in markets for labour, food, farm and non-farm inputs, and credit. But poor people and remote places often face very high physical and transactions costs of marketing per kilometre-tonne, which restrict trade, specialization and growth.

The market access problems of particular groups (such as the illiterate) are different from the problems of remote areas. In each case, problems of physical access (e.g. bad or no roads) are distinct from, but often compounded by, the transactions costs of, or bias in, institutional market access (e.g. trader or marketing-board monopsony). Problems interact: women, and indigenous ethnic minorities in both Asia and Africa, are more likely to be remote dwellers; bad roads are linked to trader monopsony power. But resources can be saved by deciding at the start which problems are tackled most cost-effectively, so as to achieve a given poverty reduction through better rural market access.

Almost everywhere, remote and ill-connected rural people are poorer. If they have potential tradable surpluses, then realizing these, usually through better farm technology, is a precondition for generating exchange and cutting poverty through better roads. If an area feeds itself adequately but lacks transport links, these are usually needed to make yield-enhancing staples technology attractive. For cash crops or non-farm products, better roads are usually needed to permit expansion, marketing and growth through specialization. There are many cases of poor non-remote people – separated by terrain, not distance, from nearby markets – whose welfare increases greatly when improved access to such markets allows trade and exchange.

Beyond physical access to markets

Physical access is not just about access to roads. Even if the rural poor or the remote have roads, their lack of choice over modes of transportation and other forms of market access can expose them to large transactions costs or institutional costs. Private monopoly traders and parastatal marketing boards expose the poor to market power, while the non-poor can more readily find alternatives. Yet withdrawal of parastatals or monopsony traders following liberalization often leaves the rural poor

stranded altogether. Marketing cooperatives, to bulk up for purchase or sale, are a decentralized solution, depending for success on acceptance as 'institutions of trust' or so-called 'social capital'. Regulation to control adulteration, weights and market-rigging can be useful; improving market institutions is often a necessary complement to liberalization, if the effect of better prices on poor rural people is not to be swamped by marketing costs.

Commercialization usually improves the welfare of the poor. Being intelligently risk-averse, they usually avoid premature commitment to all the risks of commercialization, e.g. keeping part of their land for self-provisioning. Indeed, cash-crop income is often used to acquire improved staples technology. Crop diversification is another way of diffusing risk, but rapid change is often not practicable: for example, tree crops require several years growth before a crop can be harvested.

Access to input markets and technology

Access to transparent input markets is crucial for the poor. Land tenure reform is a poor substitute for land asset distribution. Water markets, while providing fewer benefits for the poor than ownership of water-yielding assets, are almost always more pro-poor than non-price water rationing and subsidy, which benefit mostly the non-poor and leave the poor with the distortion costs. Hence rural user charges for water are usually pro-poor. In many regions, too, the tightening rural water squeeze makes some form of water pricing essential on efficiency grounds.

New farm technology is sometimes embodied in costly capital confined to the better-off (e.g. deep tubewells or tractors, whose services can of course be marketed), but has often been distributed free, as information – sometimes alongside free or subsidized seed or seed-fertilizer packages – through agricultural extension. Returns have often been high and in Asia remain so; but in Africa most

public extension services are in disarray, and unresponsive to the demands of the rural poor while in Latin America extension, like research, is increasingly privatized, even for the poor. New market routes or other mechanisms to reduce the time-lag before the poor adopt better technologies are badly needed if the poor are not to miss out on new opportunities.

Access to labour market

Labour markets affect the main income source of the poor. Discrimination against indigenous and ethnic minorities and women, though prohibited by law, is common in practice, but it works less through specific wage rates than through exclusion from high-productivity tasks or places: through lack of education and skills needed to upgrade tasks; through women's domestic 'duties' that restrict tasks; and through remoteness and language for ethnic rural minorities. Rural public works can powerfully enhance access to labour markets.

The poor are restricted by asymmetric information and high unit costs from most formal credit, and, given the co-variance of local loans, by lack of collateral from much money-lender lending. Efforts to reach the rural poor through directed, subsidized state-backed credit have largely failed. The current approach is to generate unsubsidized, but non-exploitative, microfinance markets through local peer-monitored intermediation. This has had considerable success, but outreach to the very poor may conflict with financial sustainability at least until the difficult problem of the interface between informal and formal institutions has been solved.

Trade liberalization, globalization and the rural poor

Markets for the rural poor are being restructured by trade liberalization and globalization. This removes biases against farm prices, thus raising food production and employment but also food prices, with ambiguous effects on the poor.

Economic growth should normally benefit them in the long run, as should labour-intensive specialization. However, such gains can be destroyed by bad market transmission and functioning. Remote areas, benefiting despite gross inefficiencies from pan-territorial pricing, have lost out where subsidies have been removed, and where the parastatal has been withdrawn and not replaced by competing private buyers.

Though the poor on the whole gain from liberalization, substantial and disparate groups often lose, and need compensation. People with little education, few roads or contacts, or not speaking a majority language, are especially likely to be 'stuck' as immobile losers. Conversely, reasonably equal access to markets and to asset control greatly help the poor to gain quickly from liberalization; great rural inequalities, conversely, ensure that higher food prices penalize many of the rural poor as net food buyers, rather than benefiting them through extra farm income. Moreover, liberalization probably increases income fluctuations, especially though exposure to changes in export crop prices. Access to quasi-insurance or safety-nets therefore becomes important if the poor are to realize secure gains from trade.

Finally, though small farms are generally efficient and employment-intensive, globalization brings new strains – and prospects. It links product sales – especially in the booming horticultural sector, in principle ideal for small labour-intensive farms – increasingly to exports to rich countries and to supermarkets, abroad and (especially in Latin America) at home. This exposes farmers to a range of requirements, from uniform product appearance through pesticide rules to restrictions on child labour. The cost per unit of output, both of meeting these requirements for farmers and of supervising them for buyers, is initially much higher on small farms. Such agricultural globalization can undermine their economic advantages. Stimulating and supporting institutional remedies

may be vital to a pro-poor trajectory. It can be done: such solutions are emerging; no trend to larger farm size has appeared in most of Asia, nor has one been well documented in Africa or Latin America, despite globalization.

INSTITUTIONS AND THE RURAL POOR

The distribution of benefits between rich and poor, urban and rural, men and women, depends on institutions: organizations such as banks, and rules (customary or legal) such as those affecting division of inherited land or the shares of landlord and tenant in a sharecropping arrangement.

Some acceptance of institutionally mediated outcomes is essential if transactions are not to be impossibly costly and unreliable; but, unless institutions can change under pressure, a society's outcomes are 'frozen' in the interests of the existing controllers of the institutions. This favours the rural poor only if they control the institutions, or at least can compel attention to their needs from those who do.

All efforts to benefit the poor through institutional reform face a serious problem. Institutions are usually created and run in the interests of the powerful. That rural big men run local institutions in their interests is the problem for current modes of top-down institutional devolution, decentralization and participation. Governance is not only a macro issue.

Decentralization and devolution

Decentralized institutions for natural resources management and financial services rarely help the rural poorest 'directly' but often reach the moderately poor and help all through increased efficiency and sustainability, as the locally powerful are driven to recognize their shared interests with the poor in these. We review striking examples – all in more or less open societies – of the rural poor's 'learning by doing' to enhance their political power, influence and agility in the 'civic culture'.

The case for decentralization arose partly from increasing consensus that the state needed to retreat from many formerly centralized areas of production, regulation and provision, whereas in developing countries most central governments, even if motivated to perform well, lacked information to do so. While some such areas could be privatized, in others – including the management of common-property natural resources and the provision of financial services to the poor – that policy was, for various reasons, seldom considered sufficient. Various forms of decentralized control by common rural groups have therefore been tried, often with NGO facilitation and sometimes with government support for administration.

State attempts to manage formerly common property in grazing land, forests, or water-bodies generally failed; centralized exclusion of outsiders, and rationing among insiders, could be enforced, but not without tyranny or profligacy, and seldom without corruption. Privatization too proved inefficient and unequal. The third way – participatory decentralization – has become a growing trend with potential for better conservation and efficiency. What are the necessary pre-conditions for improving the record of conservation and efficiency and ensuring a better share for the poor? What methods are needed, what processes need to be built in to enlist the poor in natural-resources conservation? And how can women benefit from this devolution of natural resources management?

Financial institutions: making them work for the poor

State credit subsidies, credit labelled 'for the rural poor', usually benefited mainly the rich (and 'gatekeepers' in banks or bureaucracies), permitted low-yielding investment, and drove out competitive financial institutions. Untrammelled markets, too, did not adequately reach even the creditworthy poor. Hence microfinancing agencies were widely attempted, usually lending with-

out subsidy to small groups of borrowers with joint liability, and often providing deposit and other financial services. They were often supported by NGOs and often targeted on women and on non-farm lending. In respect of sustainability, repayment, and outreach to the moderately poor, microfinance greatly improves on most previous public and private rural credit; yet it, too, seldom reaches the poorest. Their risk-proneness and complex, fluctuating household economies require a wider range of financial services, often at high unit cost, and centering on insurance (and occasional consumer credit) rather than microenterprise support.

This experience of improved sustainability and efficiency, but limited outreach to the poorest, is thus shared by two of the most important types of decentralized rural institutions. To the extent that they participated, the poor did so by sharing in gains, not by raising their share: by coalition, not redistribution. This can achieve something, but seldom for the poorest, and seldom fast. With regard to the poorest, the microfinance and decentralization 'revolutions' are very far from complete.

More generally, development programmes can be captured by elites or vested interests, or can give rise to broad coalitions which share the gains. The rich may get the lion's share, or may find that it pays them to do with less, especially if the poor have political voice or can organize themselves into counter-coalitions with other persons of power. There are several examples of successful actions by women's and poor people's groups. But they need options and voice; hence the impor-

tance of a reserve of land, even if tiny, and of literacy and political openness.

Partnership and participation

Finally, the dilemma of 'willing participation into being from above' is increasingly softened, if not solved, by partnerships involving donors, governments and NGOs. But these partnerships will have an impact only if they are directed to where it really matters for the rural poor. Poverty is not an intrinsic attribute of people, but a product of livelihood systems and the socio-political and economic forces that shape them. Concretely, most rural people, and especially the rural poor, make their living in and around agriculture. Thus, for sustainable poverty reduction, the problems of smallholder agriculture must be addressed directly and effectively. This involves change in material factors – land, water and infrastructure – and in technology and knowledge for, and in the hands of, the poor. But it also means change in social and economic relations, usually involving institutional change that gives the poor more control over their own environment. Many of the policy changes in the developing world have the potential to benefit the poor. But globalization and decentralization will work for them only if broad partnerships are mobilized to solve the challenges they confront: equitable and efficient market-mediated relations, and accountable social and political institutions. Economic empowerment is creating an institutional framework in which the poor can put assets, both public and private, to work on their own behalf.

CHAPTER 2

THE RURAL POOR

The majority of the world's poor are rural, and will remain so for several decades. Poverty reduction programmes must therefore be refocused on rural people if they are to succeed. Poverty is not gender-neutral: women enjoy less access to, and control over, land, credit, technology, education, health care and skilled work.

GETTING THE PRIORITIES RIGHT

Most of the poor are rural and will be so for several decades. Their income, spending and employment usually concentrate on staple food. They have little land, schooling or other assets, and face many interlocking barriers to progress. Poverty and hunger have fallen massively, mainly due to rural and agricultural development, especially during 1975-90. Yet this improvement, and parallel progress in agricultural production, have stalled during the last decade, and many rural regions have been excluded. Rural-urban poverty gaps have not declined globally. The share of international aid and attention devoted to agriculture, rural development and the rural poor has been small and falling. The sustainable reduction of poverty and reaching the poor through development efforts, investment and aid still remain a major challenge for the development community.

Rural poverty reduction deserves much greater emphasis. The demographic window of opportunity which has transformed the prospects for progress in East Asia in the past 30 years can do so in other developing countries in the next 30,

but only if benefits target the rural poor. Some rural poverty is transient; this can be reduced by attacking the causes of rural vulnerability.

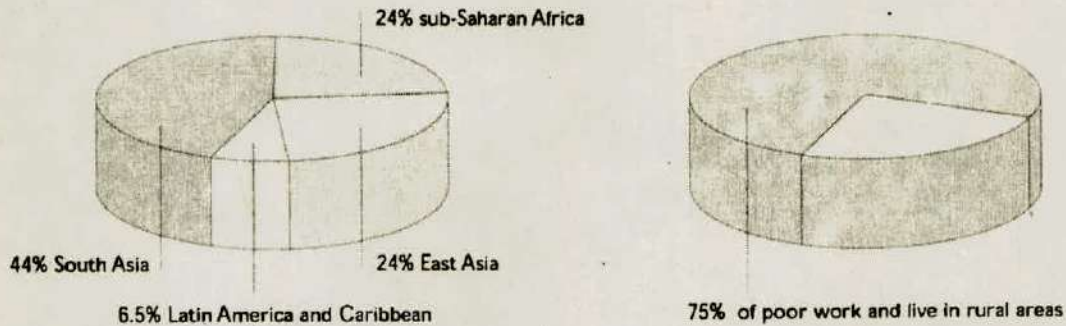
Donors recognize the need to reverse the decline in progress in the effort against poverty, but may not be aware of the need to concentrate on rural poverty. Yet, the poor are mainly rural; they, and their civil societies and governments, can be empowered to participate in development only if they have the resources to do so.

RURAL POVERTY?

Some 1.2 billion people worldwide consume less than a 'standard' dollar-a-day; they are in dollar poverty.¹ Forty-four per cent are in South Asia, about 24% each in sub-Saharan Africa and East Asia, and 6.5% in Latin America and the Caribbean.² Seventy-five per cent of the dollar-poor work and live in rural areas; projections suggest that over 60% will continue to do so in 2025³ (Chart 2.1).

These are good reasons to emphasize rural poverty reduction, and to redirect attention and expenditure towards agricultural development

Chart 2.1: Global distribution of rural poverty



that generates employment. Moreover, official data overestimate the shift of the poor from the countryside to cities, further strengthening the case for greater emphasis on rural poverty.

There would be less need to emphasize the importance of reducing rural poverty if

- public action were more cost-effective in reducing urban poverty;
- the rural poor gained far more from urban poverty reduction than vice versa;
- rural anti-poverty spending discouraged the poor from migrating; or
- rural poverty reduction promoted less economic growth than urban poverty reduction.

None of these is usually the case.

Cost-effectiveness

Where resources have to be divided between rural and urban spending on, for instance, health and education, outlay per head is normally less in reaching rural areas, even though rural people have lower initial health and literacy. So higher spending in rural areas should normally improve outcome more than higher spending in urban areas.

Rural anti-poverty policy is focused on increasing the productivity of the poor, often with success. But much urban anti-poverty policy concentrates on improving the shelter and sanitation of the poor rather than their opportunity to earn.

Public spending in rural areas is also likely to be more effective in reducing poverty than spending in urban areas where the costs in infrastructure and direct investment to create work are higher.

Within agriculture, the main rural activity, there are few economies of scale. Small, labour-intensive rural units are more likely to be efficient in rural areas than in urban industry and modern services.

However, the dispersion of rural public action, and consequent high management costs, could offset the advantages of rural public spending.

Rural-urban interactions

Urban work encourages migration from the countryside to the city. Creating work in the cities might well attract more people seeking work from rural areas. This could well leave urban unemployment rates unchanged.⁴ Urban-oriented policies alone may fail to reduce urban poverty: they may make urban living more attractive, but congestion costs would rise and the wages of the urban poor would fall.

If staples prices fall, but non-labour costs of staples cultivation on smallholdings fall faster, then poor small farmers, farm workers and urban food buyers, who spend most of their incomes on food staples, can all benefit. Evidence from the Green Revolution shows that this can be achieved. There is no corresponding urban output that, by being

expanded or made cheaper, enriches the rural poor: the most cost-effective way to reduce urban poverty may be to reduce rural poverty.

Rural to-urban migration

This migration is partly a way of sharing risk by⁵ families which maintain rural and urban households, often shifting members between them.⁶ But there are risks and costs in rural-to-urban migration which the poorest can rarely bear. 'Unequal', rather than low-income, villages seem to have high rates of rural-to-urban migration, with moderately poor people pushed out and moderately well-off people pulled out. But the poorest are not likely to stay in the city permanently.⁷ Reduction in rural poverty probably reduces short-term migration to towns, too, but raises the medium-term mobility of the near-poor, as many South and East Asian experiences show.

Growth effects of rural and urban poverty reduction

Countries with very unequal assets and (perhaps) income usually experience slower economic growth.⁸ This matters for the choice between rural and urban poverty reduction in two ways. First, some inequality of reward seems necessary to create incentives for effort, achievement, or meeting effective demand. But inequality that reflects ascribed position, status or inheritance reduces earned incomes, and creates barriers to the advancement of capable persons. This happens when more or better schools, clinics, prices, or research inputs are assigned to people just because they are born in towns. So, severe rural-urban inequality probably

retards growth. Second, concentrating resources in large units of production is usually bad for equality, but can be good for growth if, and only if, there are economies of scale. Agriculture generally lacks these; many urban activities feature them. Concentrating anti-poverty resources on the rural poor is consistent with small-scale (and labour-intensive) production, and this is likely to promote both efficiency and equality.

The apparently higher returns which expenditure brings to reducing rural, rather than urban, poverty justifies that commitment, particularly given the greater incidence and depth of rural poverty (Annex Table 2.1)

DEFINITIONS OF 'RURAL'

There are two main rural characteristics. First, rural people usually live in a farmstead or in groups of houses containing perhaps 5 000-10 000 persons, separated by farmland, pasture, trees or scrubland. Second, most rural people spend most of their working time on farms.

National distinctions between rural and urban are arbitrary and varied. The most common definition of the borderline is 5 000 persons, as in India; often it is 2 500 persons or fewer, as in Mexico, or 10 000 or more, as in Nigeria. Other countries, including Brazil and China, do not specify a population size but use various characteristics, from typical metropolitan facilities to legal or political status.⁹ The lower the rural-urban borderline is set, the fewer people are classified as rural. Legislative and political borderlines are even harder to interpret. This requires caution in inter-

Box 2.1: Why does it matter how different countries define 'rural'?

Suppose that Country A (Gabon) sets the rural-urban borderline at 2 000 persons, and Country B (Nigeria) at 20 000 persons. A much higher proportion of the population – and of the consumption-poor, with less than, say, USD 1 a day – will be counted as rural in B than in A, even if the actual distribution of the population among different sizes of place within A and B is identical. In that case, the proportion of public outlay on health, education, or food relief in rural areas, as officially defined, ought to be far higher in B than in A. And any migration from rural to urban areas will normally seem greater in A than B owing to the definition of 'urban', even if events on the ground in A and B are identical.

Box 2.4: Measuring consumption poverty: identification and aggregation

Step 1. Identify the poor

Five techniques are in widespread use for setting the poverty line.

1. The food energy method (FEM) estimates a food-energy minimum required to satisfy dietary energy (caloric) requirements and then determines the level of income/consumption at which this minimum is typically met.
2. The cost-of-basic-needs (CBN) method sets the poverty line as the level just sufficient to buy an exogenously set low-cost adequate diet plus other cheap basic requirements.
3. The food-share method (FSM) estimates the minimum cost of a food basket that satisfies the food energy minimum and multiplies this by the share of non-food expenditure in total consumption of a sub-group defined as poor.
4. The international poverty line method is described in endnote 1.
5. The relative consumption method sets the poverty line at a percentage of national mean or median consumption, often half or one third.

Often a set of poverty lines is used, ranging from extreme poverty to moderate poverty.

Step 2. Add the numbers up

Once a poverty line is set, poverty below the line can be added up. There are many ways of doing this, each telling us something different about the extent and nature of poverty. The three most widely used measures of poverty are as follows.

1. The headcount ratio measures the incidence of poverty (P0) and is simply the number of poor people divided by the total population. But this fails to show how poor the poor are. Two countries may have the same headcount ratio but the poor in one country may be much poorer than the poor in the other country.
2. The poverty gap (P1) index gets over this problem by incorporating the depth of poverty. Each poor person is weighted by his/her proportionate shortfall below the poverty line, indicating how poor he/she is. But neither P1 nor P0 allows for inequality amongst the poor: if a poor person consumes ten rupees a day more but an even poorer person ten rupees fewer, neither P1 nor P0 rises, yet most of us would agree that poverty has got worse.
3. The poverty severity (P2) measure solves this by weighting each poor person by the square of his/her proportionate shortfall below the poverty line. The P2 measure is the most comprehensive because it increases when the number of poor people increases, or the poor get poorer, or the poorest get poorer compared with other poor people.

All of these poverty measures express values between zero and one, with numbers close to zero indicating little poverty and numbers closer to one indicating substantial poverty.

The scalar approach identifies who is poor and then aggregates the information into a scalar measure or index. This requires choosing the indicator of poverty, setting a threshold in this indicator below which lie the poor, and adding up the numbers. This can be done in different ways (Box 2.4). We use absolute poverty lines fixed over time, and indicate where we use lines (such as the Purchasing Power Poverty [PPP] dollar-a-day measure) that are the same for all countries, as against national lines.

WHO ARE THE POOR?

Knowing and understanding the poor is as important as understanding poverty. Three quarters of

the world's poor people, amounting to 0.9 billion, live in rural areas. Who are they, and where do they live? How do they get and use income? What are the barriers to their progress, especially in terms of inadequate health, schooling, land and other assets? In each case we ask how these characteristics differ across regions, and whether they help us resolve an issue crucial for policy: are these characteristics causes or effects of poverty? IFAD's categorization of the rural poor in its regions of operation provides an overview of the location and the types of poor people (Table 2.1).¹⁸

Wage labourers, especially landless or casually employed farm-workers, are almost everywhere

Box 2.5: The human development and human poverty indexes

The evolving concepts of the human development index (HDI) and human poverty index (HPI), defined in successive issues of UNDP's *Human Development Report*, are multidimensional-indexed basic needs measures. The HDI is a weighted index of: life expectancy at birth; a weighted average of over-15 literacy and primary, secondary and tertiary enrolment rates; and per capita purchasing-power-parity GDP. A country with imposed maximum values of, respectively, 85 years, 100%, 100% and USD 40 000 scores the best feasible HDI, while a country with 25 years, 0%, 0% and USD 100 scores zero. The HPI is measured in developing countries by the average of (a) percentage of persons not expected to survive to 40, (b) percentage of adults illiterate, and (c) the average of percentage without access to safe water, percentage without access to health services and percentage of under-fives moderately or severely underweight.

Weightings within the HDI and HPI are somewhat arbitrary. A bigger problem with a single misery indicator, combining consumption poverty with health and education deprivation, is that it loses information compared with separate measures. For instance, identifying which groups escape consumption poverty, or achieve high literacy and low mortality, helps to unravel the linked disadvantages of the rural poor – who tend to show worse mortality, under-education and gender discrimination, for example, than do the urban poor.

among those most likely to be poor, though in Africa smallholders are the largest poor group. Poverty incidence among children is everywhere much higher than among adults. Female-headed households are more often found in Latin America and the Caribbean, West and Central Africa and East and Southern Africa than in Asia and the Pacific; but in most of West and Central Africa and East and Southern Africa they are not much more likely to be consumption-poor than male-headed households. In Near East and North Africa, a high proportion of the rural poor are women, children and the elderly due to high out-migration of prime-age males in the region.

Where do the poor live?

National surveys often show that poverty incidence and numbers concentrate in rural parts of a few geographic areas, for example, North-Western China, East-Central India, North-East Brazil and North-Western Mozambique. The incidence and severity of rural poverty almost everywhere exceed urban poverty, though in Latin America high levels of urbanization mean that most of the poor live in urban areas.¹⁹

People in irrigated zones within rural areas face much lower poverty risk.²⁰ Many poor people live in marginal and degraded areas; vulnerability, and

probably poverty incidence and intensity, are much greater there. One study found that 634 million rural poor, of whom 375 million are in Asia, live in marginal lands.²¹

Generally, the poorest of the rural poor live in remote areas, even in East and Southern Africa, where most of them live in densely populated areas, particularly near capital cities. Smallholders tend to live in dryland areas in West and Central Africa, Asia and the Pacific and Latin America and the Caribbean. Poor farmers in former East and Southern African colonies are found in areas of low agricultural potential, but elsewhere in the region the poor are in areas of moderate to high agricultural potential, often unrealized, because of barriers to progress. Geographic concentrations of poverty may be intensified by further discrimination or exclusion: for instance, high-poverty areas will fall even further behind if banks refuse them credit.

Poverty in Latin America is highest in some of the more remote, less densely populated areas: the rural sierra and selva of Peru, southern states of Mexico, the Andean highlands and northern lowlands of Bolivia, the semi-arid Norte Chico of Chile and the rural Oriente of Ecuador. Many of the poorest regions in Latin America are located at high altitudes or have low level of rainfall.

Table 2.1: Who are the poor? by region

Region	Rainfed farmers	Smallholder Farmers	Pastoralists	Artisanal fishermen	Wage labourers/ landless	Indigenous people; scheduled castes/tribes	Female-headed households	Displaced people
WCA		✓						
ESA		✓		✓	✓			
AP		✓	✓	✓	✓	✓	✓	✓
LAC	✓	✓	✓	✓	✓	✓	✓	✓
NENA	✓		✓	✓	✓	✓	✓	✓

WCA: West and Central Africa; ESA: East and Southern Africa; AP: Asia and the Pacific; LAC: Latin America and the Caribbean; NENA: Near East and North Africa

Source: IFAD 1999 a, b, c, d, e, f.

Pastoralists in Near East and North Africa tend to be transhumants, but are generally found in the steppe regions. In Asia and the Pacific and Latin America and the Caribbean, pastoralists are found on high mountain slopes and on plateaux, remote areas with harsh climates. In Near East and North Africa and Latin America and the Caribbean, in contrast with other groups, wage earners are located in lowland and more densely populated areas, where work opportunities exist. Indigenous groups are the most isolated, living in the highlands and rainforests of Latin America and the Caribbean and mountainous areas of Near East and North Africa and Asia and the Pacific.

How do the poor get income and how do they use it?

Most poor rural households diversify their sources of income. Smallholder households in all regions often combine traditional or cash-crop cultivation with raising small livestock. For instance, in Near East and North Africa, households with livestock grow food crops to supplement their incomes. Own-farm income is often only a small proportion of total household income. In Near East and North Africa, West and Central Africa, Asia and the Pacific and East and Southern Africa, off-farm income is often the poor smallholder's main source of cash income, although this is often from low-return activities. In Near East and North

Africa, farmers dependent on rain might migrate to irrigated areas.

Artisanal fishermen diversify their incomes in a number of ways. In East and Southern Africa, they supplement their low fishing incomes by growing cassava in the hinterland. In Near East and North Africa, fishermen engage in crop or livestock production.

The landless in Near East and North Africa and Latin America and the Caribbean are permanently or seasonally involved in daily farm or off-farm work. In Latin America and the Caribbean the landless might be involved in small enterprises or food processing, but often control enough land to produce food for home consumption. In contrast, the landless in Asia and the Pacific are mostly agricultural wage labourers.

Indigenous people tend to be less socially and economically integrated. In Asia and the Pacific they rely on gathering and animal husbandry; in Latin America and the Caribbean they earn a living from river fishing and making handicrafts for local markets.

Poor people typically save in good seasons but run down their reserves in lean times; overall, their consumption is seldom much below their income. Of their consumption, typically 45-60% is on food staples - cereals, roots and tubers, and pulses - and a further 15-20% on other foods. In developing

countries in 1996-98, 55% of calories came from cereals (51% from rice, wheat and maize alone), and a further 7% from roots, tubers and pulses.

The proportions are considerably higher for lower-income countries - in 1996-98, 78% of calories were derived from staples in Mozambique, 72% in China, 69% in India and Nigeria, and 49% in Bolivia - and, within such countries, for poor people, as many household surveys confirm. Among the rural poor, the proportion is highest; in Asia and Africa over three quarters of calories come from staple foods. For the poorest 10-20%, at serious risk of nutritional harm, the share of consumption of food, and of calories from staples, both usually exceed 75% in rural areas. Rice and wheat are prominent in the diets of the Asian poor, and to a lesser extent the Latin American poor; maize, millet, sorghum, yams and cassava are typical in sub-Saharan Africa.²²

The importance of staples in the lives of the poor is enhanced by three facts: agriculture provides about 60-75% of rural work; staples cover about 62% of arable area; and the rural poor are relatively more likely to grow staples. In poorer countries these proportions tend to be higher. For example, of arable area harvested in 1966-68, staples covered 97% in Mozambique, 90% in Nigeria, 78% in China and 74% in India, but only 46% in Bolivia, 44% in the Russian Federation and 38% in Brazil. For low-income countries as a whole, staples provide over two thirds of farm income from employment and self-employment; poor people deriving part of their income from cash crops are likely to grow staples as well. In remote areas with high transport costs, staples probably dominate the income and employment of most of the rural poor. They are also a major source of non-farm income: in Bangladesh over a quarter of value added in rice, the main crop, is derived from post-harvest rice processing.²³

Cash crops and livestock are important for the survival of some very poor people; staples are not

necessarily better for them than cash crops. In much of Near East and North Africa, and in arid areas elsewhere, pastoralism and cash crops are the only available source of income and employment. Groups such as migrant cocoa farmers in Southern Ghana and coffee smallholders in Costa Rica have escaped poverty through cash-cropping. But usually for very poor rural people livestock and cash-crops are not the main source of income and employment, but supplement and contribute to growing staples. Indeed, rapid growth in yields of staples has contributed most to the reduction of poverty in recent decades, and has released land and labour for further poverty reduction based on cash crops, livestock and non-farm activity.

What access do the rural poor have to assets?

In all regions, the rural poor lack the important asset of good quality land. Land size is often too small to ensure the nutritional well-being of the household. Indigenous groups in Latin America and the Caribbean face particular problems in gaining access to land. Many have lost land owing to abuse, discrimination and poor information about property rights.

Access to other productive assets is also lower among the rural poor. In Near East and North Africa lack of access to water is a particular concern. In Asia and the Pacific, East and Southern Africa and Near East and North Africa, lack of draught power severely handicaps poor farmers, as does lack of access to credit, agricultural inputs and technology. Women find such assets particularly difficult to obtain in Asia and the Pacific and Near East and North Africa, where lack of male labour in female-headed households is an important constraint. In Latin America, the higher poverty rates in rural and remote areas stem partly from the concentration of indigenous people in these areas. Poverty rates among the indigenous populations in Mexico, Peru and Bolivia are much higher than among other racial groups. Indigenous

people elsewhere, for example in Brazil and Colombia, also have higher poverty rates than others. Human capital levels are lower for these groups in Latin America but, even after taking low access to education into account, they are more likely to be poor. Only half the rural poor in Nicaragua possess legal title to housing, and they have much more restricted access to services.²⁴

The rural poor also lack human capital in all regions. In West and Central Africa, Latin America and the Caribbean, and East and Southern Africa the public provision of health services, education, water and sanitation is strongly biased towards urban areas. In East and Southern Africa, households led by people who have little education are poorer than those with some education. In Near East and North Africa and Asia and the Pacific, female-headed households have particularly low levels of education and literacy, health and nutrition. Indigenous groups located in remote areas are excluded from education and health services in Near East and North Africa. Whenever possible, the poor make social investments, such as education, for the future of the family.

Social support networks are important assets for the rural poor in two regions. In Near East and North Africa displaced people are particularly vulnerable because their traditional connections have broken down. In Latin America and the Caribbean, where the poor are geographically isolated, reciprocity networks are important for economic and social survival.

Lack of boats and equipment severely handicaps poor artisanal fishermen in East and Southern

Africa. In Asia and the Pacific, tribal people suffer from a particularly serious lack of infrastructure.

What are the barriers to progress for the rural poor?

Rural people are poorer partly because they are likelier to live in remote areas, to be unhealthy and illiterate, to have higher child/adult ratios, and to work in insecure and low-productivity occupations. They may also experience discrimination as members of ethnic minorities. These disadvantages, which form an interlocking logjam,²⁵

- *overlap*: the gender gap in literacy is larger in rural areas; illiterate people are more likely to be poor; rural, illiterate women and children are more likely to come from ethnic minorities; gaps between ethnic groups are greater among illiterates and in rural and remote areas;
- *cumulate* to reduce the prospect of escape from poverty; and
- *multitarget*, affecting access to production-based food entitlements (work, land, other assets); use of pro-poor techniques of production; and mobility towards better prospects for production, consumption and hence out of poverty.

The logjams are evident from the profiles of the rural poor (Box 2.6).

The rural poor, especially women, normally have higher age-specific mortality rates than the non-poor (Table 2.2). The proportion of malnourished children in the bottom quintile is typically twice that in the top quintile.²⁶ Girls aged 2-4 suffer serious disadvantages in access to health care compared with boys, and hence worse malnutrition, in Bangladesh, Pakistan, North India, parts of China

Box 2.6: Interlocking log-jams and lagging groups in Nepal

In Nepal, gross primary school enrolment rates in 1984-85 varied from 14% for girls from poor households in the rural terai (plains) to 83% for boys from non-poor households in towns in the hills. Invariably, lagging groups did worse than otherwise comparable groups: for example, poor girls in rural hill areas had worse enrolment chances than poor boys in the same areas. Poor Nepalese children, at ages 6-9 and even more at 10-14, in each location (e. g. urban terai, rural hills), spent much more time than non-poor children in domestic and economic work.

Source: de Haan and Lipton, 1999.

Table 2.2: Poor/non-poor mortality ratios

	Adults (15-59)		Children (0-5)	
	Male	Female	Male	Female
West and Central Africa				
Côte d'Ivoire	1.5	1.5	2.4	3.3
Guinea	2.1	3.5	3.7	5.6
Guinea-Bissau	1.7	2.1	2.2	3.0
Mauritania	1.9	3.4	3.0	3.7
Niger	1.9	3.5	3.4	4.8
Nigeria	1.8	2.8	3.1	3.7
Senegal	2.2	3.8	4.0	4.9
East and Southern Africa				
Botswana	2.3	4.0	4.9	4.8
Ethiopia	2.2	3.6	3.0	4.0
Kenya	2.1	3.8	3.7	3.8
Lesotho	2.6	5.4	3.9	5.2
Madagascar	2.0	3.4	3.8	4.1
Rwanda	1.2	1.0	2.7	4.2
South Africa	1.7	3.6	4.7	5.3
Tanzania	2.1	3.3	5.6	5.0
Uganda	1.4	1.4	2.1	2.5
Zambia	2.5	3.6	3.5	3.9
Zimbabwe	2.1	2.3	4.1	5.0
Latin America and Caribbean				
Brazil	2.4	7.9	6.5	5.0
Chile	3.7	12.3	7.1	8.3
Colombia	2.1	5.2	5.6	6.8
Costa Rica	5.5	10.6	5.5	5.1
Dominican Rep	3.4	9.7	6.5	6.5
Ecuador	2.7	4.4	4.2	4.9
Guatemala	1.9	3.5	3.5	3.3
Honduras	2.0	4.0	3.2	3.2
Jamaica	3.4	7.2	7.5	10.0
Mexico	2.9	8.6	7.6	7.8
Nicaragua	2.1	5.6	3.8	4.0
Panama	3.7	7.7	6.2	5.8
Peru	1.7	3.6	3.6	3.7
Venezuela	3.0	7.6	8.9	10.8
Asia and Pacific				
China	3.4	11.0	5.9	6.6
India	2.1	3.7	4.5	4.3
Indonesia	2.3	3.1	4.1	4.1
Malaysia	3.1	5.1	13.7	15.0
Nepal	2.2	3.8	4.0	4.6
Pakistan	2.8	4.4	2.7	2.8
Philippines	2.9	6.1	5.8	5.9
Sri Lanka	2.7	5.7	10.8	8.7
Near East and North Africa				
Former Soviet Union				
Egypt	2.5	4.1	3.2	3.5
Kyrgyz Republic	2.1	8.0	5.7	6.1
Romania	2.3	8.4	9.9	9.2
Tunisia	2.2	3.8	3.8	3.7

Source: WHO 1999.

and Near East and North Africa;²⁷ gender disadvantage does most harm to poor girls, because the average level is already so low.

Education illustrates this problem of interlocking disadvantage well. The rural poor have few human assets; the household head is likely to be illiterate; and high dependency ratios, correlated with poverty, independently reduce access to schooling. It is especially among the poor that girls have worse chances of education than boys. Educational enrolment is uniformly lower among the poor, and access is conditioned by location. Rural enrolment ratios are especially low; rural girls, unlike equally poor urban girls, have few prospects of escaping from poverty. In many developing countries the second or third poorest urban decile gets more education than the second or third richest rural decile.²⁸ Poor rural children are likely to become poor adults.

Land ownership is a key determinant of poverty: most of the rural poor are landless, or small farmers. Increasing land pressure from population growth impedes rural farmers' ability to expand production beyond the subsistence level in East and Southern Africa. If the poor own land, the farms are typically very small, dryland or in low-fertility regions. In Near East and North Africa, landholding size is declining owing to inheritance laws.

In East and Southern Africa (as suggested by evidence from Kenya, Madagascar and Uganda), most of the rural poor are smallholders, mainly growing subsistence crops and augmenting their incomes with small ruminants or poultry. There, as in Latin America and the Caribbean, Asia and the Pacific and West and Central Africa, marketing problems are a particular barrier to the advancement of the rural poor. This reflects a lack of physical assets such as production inputs and infrastructure in East and Southern Africa. In Asia and the Pacific, smallholders' distance from markets results in high transportation costs for acquir-

ing inputs and selling produce. In East and Southern Africa and Latin America and the Caribbean, smallholders often lack capacity to establish reasonable terms of trade; in Latin America and the Caribbean, they have no political lobby to fend off competition from large enterprises. In Latin America and the Caribbean and West and Central Africa, smallholders adopt risk-avoidance strategies, preferring productive stability to increased productivity. Until measures are taken to decrease hazards of smallholder cultivation in these regions, the poor find it harder to pull themselves over the poverty line.

The rural landless are most likely to be poor in many situations. The diversification of household income and prospects for the landless are held back in East and Southern Africa by limited off-farm opportunities. Here, poverty interacts with high vulnerability. In Near East and North Africa, low health and education endowments result in low remuneration levels for the landless.

Landless agricultural workers, and smallholders, are vulnerable to seasonal unemployment. In bad harvests, landless and near-landless hired workers are the first to become unemployed, before farm self-employment is cut. The landless are more likely than farmers, even small ones, to die in famines.²⁹

Interlocking barriers can also be socio-political. For example, indigenous people often face discrimination in the intense competition for scarce rural employment. Political instability makes it harder for the rural poor to move above the poverty line. Parts of East and Southern Africa and Near East and North Africa have suffered from civil conflict in recent years, which has adversely affected male labour supply. Some isolated areas of Latin America and the Caribbean are affected by guerrillas and drug trafficking, which displaces populations to marginal land or urban areas. Upland areas of Asia and the Pacific are also experiencing rising violence and political instability.

which intimidates the rural poor and increases the risks to agricultural production.

Pastoralists are also over-represented among the rural poor in parts of Africa, and Near East and North Africa especially. More than 10% of Africa's rural population is pastoralist. They are especially likely to lack schools and clinics. Because of their high mobility, as well as official neglect, they are often omitted from income and expenditure surveys, as in Mauritania, despite being a significant part of the population.³⁰ Their grazing land is likely to be encroached upon by settled farming communities, partly because of degradation caused by over-grazing and drought.

Government interference in traditional livestock management practices threatens the livelihood of pastoralists in Near East and North Africa. In Latin America and the Caribbean, as in East and Southern Africa, overgrazing of pasture, which causes soil erosion and reduces cropping, poses an environmental problem.

Artisanal fishermen in Near East and North Africa suffer owing to the highly perishable nature of their product. Lack of refrigeration and access to markets limits the time available for sale. The prospects for their families are affected by very low provision of social services, including health and education. In Asia and the Pacific, fishermen are at risk from natural disasters and competition from commercial fishing enterprises.

In most regions, poverty incidence is highest in marginal areas at risk from poor soils, low rainfall and adverse climatic change, though poverty is much less the cause than the consequence of environmental degradation.³¹ Soil erosion leads to a vicious circle of falling yields, increased exploitation, and further erosion. However, given the right conditions, such as access to capital, poor people have proved capable of improving their environments; intensified land use can be accompanied by environmental improvement rather than degradation.³²

Drought affects much of East and Southern Africa and some of West and Central Africa every few years with devastating consequences for small-holders and local economies. Water is scarce in Near East and North Africa and increasingly in other drylands. The poor, lacking irrigation technologies, are particularly vulnerable to climatic change. Low investments in rainfed technology exacerbate the problem. Limited water supply and short growing seasons in mountain terrain restrict cropping patterns.

Indigenous populations face barriers to progress owing to both discrimination and their geographical location. In Near East and North Africa, they have little voice in government affairs. In Latin America, they are more likely to be poor, especially if they lack literacy in Spanish (or Portuguese); 85% of households headed by Aymara speakers in the rural sierra of Peru are poor.³³ Poverty overlaps with location (the Sierra and the Amazonian region in Ecuador; the North, North-West and South-West regions of Guatemala; the Chiapas region in Mexico; and the northern and the Segovias regions in Nicaragua). Such people tend to be excluded from education, employment and health care. The steady exclusion of indigenous minorities from good land is also associated with persistent rural poverty in parts of Asia.

Barriers to progress often form a vicious circle. (a) Many remote rural populations lack social services, which in turn affects their productive ability. (b) Physical (remoteness) and social barriers to markets interact similarly. (c) Remoteness and low population density result in inadequate infrastructure provision in East and Southern Africa, Asia and the Pacific and Near East and North Africa. This affects not only productivity but also access to social services, making the rural poor more vulnerable to famine and disease, and prolonging sickness. (d) Poor access to health facilities, sanitation and immunization impairs the productivity, income and nutritional status of

the poor in all regions, in turn making them less able to escape poverty or seek out health care. (e) Poverty increases exposure to short-term migration and hence Acquired Immunodeficiency Syndrome (AIDS), which in parts of Africa has terribly impaired the working capacity of the poor. (f) Lack of education for poor rural women keeps fertility high in Asia and the Pacific, and large family size impedes female education and the escape from poverty.

In spite of this, the last 50 years have seen unprecedented progress in reducing global poverty. This has been possible despite interlocking constraints. Key constraints vary across countries and regions. Removing a critical constraint – sometimes land maldistribution, sometimes low-yielding seed varieties or lack of schooling – often enables rural people to overcome others themselves. A simultaneous attack on many fronts can sometimes work well; in 1977-85, rural poverty in China plummeted with the combined impact of egalitarian distribution of communal lands, better seeds, more irrigation and less repression of farm prices. In general, rural poverty reduction requires correct identification of key constraints, and correct sequencing of actions to relieve them.

The linked disadvantages of poverty and gender

Poverty is not gender-neutral. Women have less access to, and control of, land, credit, technology, education and health, and skilled work. Women also suffer discrimination in pay and in access to land, legacies and credit. Though the evidence (in most countries) does not suggest that women are more consumption-poor than men, their control over income is certainly less. It is based on more menial and less self-directed work accompanied by the 'double day' of care for home and children, frequent pregnancies and frequent child deaths.³⁴

Women's disadvantages, even in terms of survival chances, are not always a matter of poverty: the sex ratio is most adverse in the two Indian States with

lowest poverty incidence. Haryana and Punjab.³⁵ Female participation in the rural labour force varied by region: in 1981, from 2.6% in India's Punjab to 47% in Andhra Pradesh.³⁶ In districts with low female participation in the workforce, girls are seen as a burden and their survival prospects are worse than those of boys.³⁷ Women's relative survival prospects are generally brightest in countries where their workforce share is largest (around 35% for Hong Kong, China, Korea and Singapore; and over 40% for the People's Republic of China, Mongolia, Thailand and Vietnam). Discrimination in nutrition is marked in Pakistan, where the share of the female workforce is only 13%.

Rural women in India in 1983 were 12% more likely to be poor than rural men,³⁸ though this is offset by the excess of men among the poorest urban adults. In most Asian countries women, and female-headed households, are only slightly more likely to be poor than men and in female-headed rather than male-headed households.³⁹ In rural Thailand and Cambodia, female-headed households are less likely to be poor than male-headed households.⁴⁰ In Indonesia, the Philippines, Viet Nam, and to a small extent Kyrgyz Republic, rural households headed by women were more likely to be poor than male-headed households, but the opposite is the case in cities.⁴¹

Female-headed households have less access to productive assets and social services in all regions. This affects not only their current productive ability and the well-being of the household but also the intra-household allocation of resources such as food and education, which could result in intergenerational transfer of poverty. Discrimination also plays a part in Near East and North Africa where women suffer from cultural limitations on their mobility. Gender bias in customary laws is common in Latin America and the Caribbean. But in the highlands of Asia and the Pacific, where traditional society is still strong, women suffer less discrimination than do those in the rest of the region.

Discrimination in education early on in life affects the economic, social and political position of women later on. In West and Central Africa, although female-headed households are not necessarily poorer than other households, the impact of poverty is harder on women in both types of household because of the time spent on household chores and farmwork; the type of work they do is limited by their low education levels and lack of decision-making authority within the household. Exclusion from decision-making at local and national levels is also an important yet neglected female deficiency. This is sometimes not only a female phenomenon. In West and Central Africa and Near East and North Africa, the lack of effective institutions excludes the rural poor from services and prevents their voices being heard. In Latin America and the Caribbean, female-headed households are sometimes, but not generally, poorer than male-headed households, possibly because of better developed social security systems, education opportunities and employment prospects for women (such as in export agriculture) than in other regions. However, in Bolivia female-headed households are associated with a reduction of 37% of household per capita income in urban areas and 15% in rural areas, even after allowing for differences in education, household size and age.⁴² The most vulnerable group in Guatemala is female-headed indigenous households self-employed in agriculture.⁴³

Even when they are not on average poorer than men, women are more vulnerable. Women have less chance to escape poverty than men. Seventy per cent of poor women in India remain illiterate.⁴⁴ Poor rural women are almost uniformly illiterate in Bihar, Madhya Pradesh, Orissa, and Rajasthan.⁴⁵ In much of South Asia and more remote areas of the People's Republic of China the lack of education discourages women from moving to towns. Those who do move often have much lower employment rates than in rural areas.⁴⁶

Even at East Asian growth levels and in female-employing sectors such as textiles, leather, or light electronics, alleviating this gender disparity depends in part on the spread of female education. As in the case of the textile industry in Bangladesh, women usually need at least a little education to gain from expanded employment in modern manufacturing.

Cultural and policy factors impinge on gender disadvantage in poverty, as upon urban and regional bias: Laos, Sri Lanka and Viet Nam show much less female disadvantage than would be expected at their income levels. The disadvantages of female-headed households in Asia tend to be not so much lower income or higher poverty as less leisure, fewer opportunities, greater vulnerability, worse health, or less education.

The removal of gender inequities in the face of poverty has been as much a cause as an effect of growth: depriving a good farmer of land, or a bright child of schooling, because she is female, is not only unfair, it is also a barrier to growth. Gender inequality in education and employment in sub-Saharan Africa reduced per capita growth during 1960-92 by 0.8% a year.⁴⁷ In Burkina Faso, inefficient factor allocation within the household results in an estimated 6% loss in output.⁴⁸ In Zambia, if women were to have the same degree of capital investment in agricultural inputs as men, output would increase by up to 15%.⁴⁹

Female farmers are at least as efficient as men when individual characteristics and input levels are accounted for.⁵⁰ In Burkina Faso, if they have the same education, women use land somewhat more productively than men. Education is the key. For maize in Kenya, primary education has a positive and significant impact on yields only on female-managed farms, perhaps because women are much less likely than men to receive agricultural extension (a good substitute for education as a source of farm knowledge). Furthermore, it has been estimated that if female maize farmers are

given sample mean characteristics and input levels, their yield increases by 7%. If given the same characteristics and inputs as men, their yield would increase by 9%. Giving women one year of education can lead to an estimated 24% increase in yields. Removal of gender discrimination is both intrinsically right and has beneficial effects.

VULNERABILITY

Rural areas are more at risk from large falls in employment induced by climate; from droughts and floods; from illness and high mortality; and often from war, cattle raiding, or civil disturbance. The poor are especially vulnerable to most such risks. They are also less resilient: a 5% fall in income, or an illness involving lost work and costs of treatment, is more threatening for those with little or no savings, insurance or access to credit. Rural people, especially in remote areas, also have weaker access to governmental, financial, or insurance support. On the other hand, rural people in emergency situations are usually supported by closer links to community or kin, and are less vulnerable than townspeople to macroeconomic phenomena such as cyclical unemployment or inflation,⁵¹ though not to market collapses affecting particular products.

The rural and the poor are, in general, much more vulnerable to fluctuations in well-being than the urban and the non-poor: the fluctuations are larger and resilience is less. But this is not true of some of the rural and the poor; their main problem in irrigated areas with adequate primary health provision is low average well-being, not sharp downward shocks. It is an empirical matter whether the poor's vulnerability is better attacked by reducing their downward fluctuation or by raising their average incomes – a vital issue in many irrigation systems. Like ill-health and illiteracy, vulnerability is a characteristic often linked to poverty, especially rural consumption poverty, but it is not the same as poverty, or part of it.⁵²

Poor people, especially in rural areas, are particularly likely to be vulnerable to the consequences of two patterns of events. The first involves a high rate of child deaths, linked to many and closely spaced births, and large, chronically poor families. The second pattern involves sharp income reductions in bad times, inability to build up or keep assets (including skills), reliance on unskilled and often casual labour for income, residence in unreliably watered rural areas and transient but frequent and severe poverty. The current rapid transition from higher to lower fertility is transforming both these patterns of events. Deaths (outside the worst AIDS-hit areas) and births that push people into, or deeper into, transient poverty are getting rarer and, with delayed marriages, later. The fertility transition also alters the dynamics of chronic poverty by inducing large rises in the proportion of people who are of working age.

The rural and the poor are usually late in acquiring the changes in provisions and incentives that reduce fertility: better prospects for child survival, girls' education and women's work. So the gains from fertility transition – sharply rising worker/dependant ratios in the long run, fewer poverty-increasing deaths and births in the short run – arrive later among the rural and the poor, unless policy speeds them up.

Demographics: delayed transition, windows of opportunity, and the shadow of AIDS⁵³

In much of Asia and Africa 50 years ago – and still often among the rural poor in many areas, notably of West and Central Africa – 20 to 30% of newborns died before the age of five. Parents insure against high death rates with even higher birth rates. Poorer families usually have higher ratios of dependent children to adults: Pakistan's 1984-85 household survey showed that the poorest quintile of households averaged 4.3 children and the richest 1.5.⁵⁴ Poorer families in this position are more likely to stay poor and assetless. Large family sizes

and high dependency ratios are associated in many empirical studies with under-nutrition, ill-health, discrimination against girl siblings and low education, as well as with poverty itself: such households are often unable to feed children adequately, or to release working children for school.⁵⁵ Women who are pressed to marry young and produce many children can seldom develop their capabilities when preoccupied with pregnancy, often risky childbirth, and lactation. Their low-skill status reduces women's earning prospects – increasing men's insistence that they produce more children instead.

This situation is being transformed by the impact on rural poverty of falling child mortality, followed 10-25 years later by falling fertility. At first this makes child/adult ratios even higher, as more new-borns survive. Later, as they grow into adulthood and as fertility falls, child/adult ratios fall sharply. Both phases affect dependency ratios (the ratio of the number of people aged 0-15 or over 60 to the number aged 15-60) dramatically: in China the ratio fell from 154 in 1950 to 115 in 1970, then rose to 133 in 1980 and 186 in 2000.

Adults aged 15-60 are most likely to work and save; this factor is estimated to account for 1.7% per year of East Asia's growth of real GDP per person in 1970-90.⁵⁶ This helps the poor; each percentage point of growth normally produces at least a comparable fall in the incidence and severity of extreme poverty. Fertility decline also reduces poverty almost as much through improved income distribution (typically with a time-lag), perhaps by moderating the supply of labour and the demand for food. The gains for the poor are highest where initial poverty and fertility are highest.⁵⁷

Fertility has been declining, since the 1980s at least, throughout most of the developing world, including Africa.⁵⁸ The dramatic effects on worker/dependant ratios, following earlier rises as child mortality fell, can be seen in Annex Table 2.3. The rising proportion of working-age persons in

2000-15 affects almost all the developing world. Even the damage from AIDS in Africa will not radically change this.

Will this huge demographic boom in workers and savers be enough to reduce most rural poverty, as it has helped to do in much of East and South-East Asia? The answer depends mainly on whether the fertility transition quickly reaches the rural poor and on whether extra workers and savings are matched by extra and attractive chances for productive work and investment. Both depend mainly on the use of assets, including health and education as well as land, technology, institutions and markets – in particular their capacity to enhance staples food production, water availability and distributive empowerment.

In other words, realizing the potential for reducing poverty, especially rural poverty, in the ongoing demographic revolution is a matter of policy: it is not automatic. Success in making it possible and attractive for the rural poor to cut their dependency ratios, and to translate that into escape from poverty, requires careful actions by civil society, governments and the international system to steer more, and better managed, resources to rural and poor agents.

The rural and the poor have come later than others to benefit from the decline in child mortality and other incentives to later marriage and lower marital fertility. Rural women in developing countries tend to have between one and three more children than urban women. For the rural poor the gap is bigger.

The outcome of this demographic change, and of rural-to-urban migration, is summarized in Table 2.3 for all four developing countries with more than one year of data for rural (and also urban) age structures. Typically 4-8% more of rural than of urban populations is aged under 15, and the gap is increasing. Despite lower rural life expectancy, the rural proportions aged over 60 are also usually higher, because many rural-to-urban

Table 2.3: Trends in prime-age dependency ratios, rural and urban

Country	Year	Persons aged 15-59 per hundred people aged 0-14 or 60+	
		Urban	Rural
Brazil	1960	125	99
	1991	148	111
China	1982	195	132
	1990	228	161
Egypt	1960	105	104
	1985	135	104
India	1961	127	111
	1995	172	133

Source: UN, Demographic Yearbooks, 1979: 240-66; 1979 (special Issue): 288-372; 1985: 210-45; 1996: 218-61.

migrants return to rural areas in later life. The advantage of urban over rural areas in work-force/dependant ratios was already pronounced in the earlier years, and around 1990 the urban-rural gaps had become wide.

All four countries have already benefited from part of their fertility transition. Early rural gains tend to be smaller than urban gains and offset by adult urbanization and may even, as in Egypt, be non-existent. Rural areas eventually catch up, but if the potentially higher worker/dependant ratios in rural areas are to be realized, the fall in the death rate has to be accelerated by redressing urban bias in health assets and creating other incentives to fertility decline.⁵⁹ This suggests policies to empower rural people to choose rapid mortality and fertility transitions: better child health and nutritional care, readier access to contraception, improved work and school chances for women. Policy and institutional structures must become more pro-rural and pro-poor if the rural poor are to experience the huge overall rises in worker/dependant ratios as personal paths out of poverty.

Casting a shadow over this demographic potential is the threat of HIV/AIDS. Some 34 million are now infected, about two thirds of them in Africa. Initially a problem of the urban non-poor, HIV/AIDS in the developing world increasingly

affects the rural poor. For them especially, its demographic effects are crucial and little appreciated. In Africa, deaths particularly affect women aged 15-30: women's chances of contracting HIV/AIDS are about double that of men's. This has led to a large fall in the female/male ratio; a big rise in the numbers of motherless children; and special difficulties in hoe agricultures, often reliant by culture and tradition on women's work. And this has also led to an initial fall in the proportion of workers under 30 at the start of an epidemic, sharply reversed as age cohorts mature, so that from the mid-1990s, 15 years into the epidemic, the proportion of economically active persons aged 15-30 has been much higher than before, especially for women.⁶⁰ Yet despite the devastating impact of HIV/AIDS, and the great importance of active policy to contain it if rural poverty is to fall, its effect on the medium-term demographic transition is small. It hardly alters the major projected rises in the adult/child and worker/dependant ratios, even in badly AIDS-damaged countries such as Kenya (Annex Table 2.3).

In India, where over 70% of the population is rural, HIV is spreading faster in some rural areas than in urban ones. In many countries in Africa, urban and rural HIV/AIDS prevalence rates are similar. Particularly vulnerable are rural areas along truck routes, sources of migrant labour to urban

areas, nomadic pastoralists, and women remaining on farms with seasonal migrant husbands.⁶¹

Now that HIV/AIDS can no longer be seen as mainly a disease of the urban non-poor, the special problems of the rural and the poor – in exposure to infection, risk of transmission and hence infection once exposed, and impact once infected – become alarmingly clear.⁶² Exposure originates substantially from male migration and female prostitution. Risk of infection, given exposure, rises with female gender, female circumcision, lesions due to prior untreated venereal disease, non-use of barrier contraceptives, and probably impaired immune response due, for example, to earlier severe undernutrition before or soon after birth. Impact, given infection, worsens with lack of medical care, urgent seasonal work needs, large dependent families, and absence of savings, reserves and therefore resilience.

Countries with the highest HIV/AIDS incidence are mostly in Southern Africa, with massive, selectively male, rural-to-urban migration to seek employment in mines. This is much increased by rural inequality⁶³ and probably also by rural stagnation; policies to tackle these will also reduce the damage from HIV/AIDS. Gender roles matter too: if women can insist on condoms, refuse intercourse to men with HIV/AIDS, and obtain sufficient equality to reduce polygamy, new infections will decline. However, the main short-run remedies for HIV/AIDS are medical: free, widely distributed condoms; the registration of sex-workers and requiring them to supply condoms and checking that they comply; and regular health checks on prostitute and migrant communities. These policies must be based on government awareness and public frankness about HIV/AIDS and on consent and good practice in civil society, including the rural and the poor. HIV/AIDS will spread without health care and information, alternatives to migration (and in extreme cases to prostitution), and reduced gender biases. Appropriate interventions

have greatly reduced new infections, and hence incidence, in Brazil, Senegal, Thailand and Uganda.

HIV/AIDS probably reduces fertility substantially in the short term, as sexual behaviour changes.⁶⁴ Yet this fertility decline will not accelerate the long-run gains to the poor from fertility transition. First, such gains arise largely from higher adult/child ratios; but these are not projected to fall much as a result of AIDS. Second, even if they do, any macro-level benefits to growth, and hence to poverty reduction, arise through improved personal capacity to save, work and pay taxes, and reduced personal needs for public outlay on education; but these are swamped as AIDS imposes new health costs, reduces tax-paying capacity, and erodes the ability of victims and carers to save and work, with worst effects on the rural and the poor. Third, household gains from normal fertility transition are swamped in the wake of AIDS by household losses from disease and suffering; from death of breadwinners and mothers; and from extra care for the sick and orphaned. Finally, despite the pressures towards condom use or abstinence during AIDS epidemics, AIDS-affected African countries have only recently emerged from a high-fertility, high-mortality regime. Where AIDS has sharply raised under-five mortality, people may later revert to high-fertility behaviour, at least among uninfected couples.

The AIDS tragedy consumes lives and resources both nationally and at household level. It also diverts labour and health-care resources, sabotaging poverty reduction and development. Increasingly it attacks the medically underprivileged, the rural and the poor. Preventive remedies are known, and used in several countries. But vast as it is, the AIDS tragedy is unlikely to remove the opportunities for human advance, including rural poverty reduction, through demographic transition, and rising ratios of workers and savers to dependants.

Transience and vulnerability: short-run dynamics

Some of the poor are not poor all the time. In South and East Asia, for instance, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) work in six southern Indian villages shows that around a quarter of consumption-poor households had not been poor in the previous year, and a similar proportion would not be poor in the succeeding year.⁶⁵ Similar results have been observed in four villages in rural Pakistan,⁶⁶ in four provinces in rural China,⁶⁷ and in a sub-sample of the All India National Household Sample Survey.⁶⁸ The situation is shown clearly by an overview of panel data based on year-to-year observations (Table 2.4).

The dynamic nature of poverty means that the policies for reducing transitory poverty may be quite different from those needed to combat

chronic poverty. This distinction between chronic and transitory⁶⁹ has particular implications for rural poverty:

- a stronger emphasis on indicators which determine long-run welfare, such as land ownership;
- comparison using panel data as well as non-panel time-series,⁷⁰ as rural poverty may fluctuate more than urban poverty (given the former's dependence on agriculture and the weather);
- analysis of migration, remittances and seasonality, which ideally should be analysed within poverty dynamics; and
- policy to address targeting, consumption smoothing and insurance, and to assess who exactly within the household bears the brunt of welfare swings and how.

Several recent panel surveys trace short-run changes in the fortunes of the rural poor and near-

Table 2.4: Extent of transient and chronic poverty

	Study dates	Number of observations in panel	Proportion of households		
			Always poor	Sometimes poor	Never poor
West and Central Africa					
Côte d'Ivoire	1985-86	2	14.5	20.2	65.3
Côte d'Ivoire	1986-87	2	13.0	22.9	64.1
Côte d'Ivoire	1987-88	2	25.0	22.0	53.0
East and Southern Africa					
Ethiopia	1994-95	2	24.8	30.1	45.1
South Africa	1993-98	2	22.7	31.5	45.8
Zimbabwe	1992/93-1995/96	4	10.6	59.6	29.8
Latin America and the Caribbean					
Chile	1967/68-1985/86	2	54.1	31.5	14.4
East Asia and the Pacific					
China	1985-90	6	6.2	47.8	46.0
India	1968/69-1970/71	3	33.3	36.7	30.0
India	1975/76-1983/84	9	21.8	65.8	12.4
Pakistan	1986-91	5	3.0	55.3	41.7

Note: The surveys use national poverty lines and different lengths of panel and are therefore comparable, if at all, only with great caution and to a modest extent.

Source: Baulch and Hoddinott 1999.

poor (Annex Table 2.4).⁷¹ Three emerging issues are relevant for anti-poverty policy.⁷²

Identifying the poor

For many people, whether they are identified as poor depends on the year of survey. So at any time, many more people in developing countries are vulnerable to poverty than are actually in poverty, and many of those actually in poverty are usually not. Table 2.4 shows that generally between about one quarter and one third of households move in and out of poverty in the survey year.

The proportion of poor who are transient is much higher in rural than in urban areas, and highest in rural places with unreliable water supply. Estimates of the incidence of chronic poverty range from 3% of households (Pakistan, 1985-90) to 54% (Chile, 1967-85). Incidence of transient poverty, on the other hand, ranges from 20-22% (Côte d'Ivoire, 1985-88) to nearly 66% (India, 1975-83). It is important to note that estimates of chronic and transitory poverty vary with the choice of poverty line since mobility is unlikely to be uniform throughout the distribution.

Experience of poverty

Poverty varies over time in other ways. (a) Depth of even chronic poverty varies among years. (b) Absolute poverty may be more likely to be transient than relative poverty, i.e. being poorest may be more persistent than being absolutely poor. (c) Some who make the transition out of poverty fall back: how much transient poverty reflects people who repeatedly move above and below the poverty line; how much of poverty is just a one-off incident; or do the same unfortunate people suffer many incidents?

All this matters, because various sorts of chronic and transient poverty may demand different remedies. Knowledge of factors associated with movements in and out of poverty allows us to target anti-poverty policies to particular vulnerable groups. For

example, people who typically sink into poverty after loss of employment or changes in family status (in particular childbirth, divorce or widowhood) need employment guarantee schemes combined with support for mothers and female-headed households. We can intervene more effectively if we know the frequency and duration of poverty spells for different categories of households. Numerous short, recurring spells of poverty demand measures such as safety nets, credit and insurance schemes for vulnerable households, or in some cases more child nutrition support, or more robust plant or animal varieties. Extended spells of poverty call for policies that improve the assets and entitlements of the poor, such as education, land reform, or improved disability and old-age pensions. Further, victims of mainly transient or mainly chronic poverty, whether adults or children, or workers on irrigated or dryland farms, may differ in resilience, or otherwise benefit from distinct policies geared to the interaction of poverty, duration and type of person.

Furthermore, transient poverty may often deepen and evolve into chronic poverty through repeated poverty triggers. Policy-makers need to know what these triggers are in each region, and to interact sensibly with poor people's own attempts to anticipate or cope with them.⁷³

Explanations of poverty

The emerging, though tentative and largely country-specific, explanations of poverty shown in panel data are summarized in Annex Table 2.4.

RECENT HISTORY OF RURAL POVERTY AND DONOR RESPONSE

Rural welfare indicators have improved, but rural-urban gaps are high and not shrinking

Rural areas generally have less access than urban areas to safe water, adequate sanitation and some health services (Table 2.5). The data are very approximate, but differences are generally larger in West and Central Africa than elsewhere. In

Table 2.5: Access to health and sanitation

	Adequate sanitation (1990-97) ^{a/}		Safe drinking water (1995) ^{b/}		Health services (1985-95) ^{c/}	
	Urban	Rural	Urban	Rural	Urban	Rural
West and Central Africa						
Burkina Faso	41	33	n.a.	n.a.	100	89
Cameroon	64	36	n.a.	30	44	39
Chad	n.a.	n.a.	48	17	64	n.a.
Ghana	62	44	88	52	92	45
Guinea-Bissau	n.a.	n.a.	38	57	n.a.	n.a.
Mauritania	44	19	87	41	72	33
Niger	79	5	70	44	99	30
Nigeria	50	32	80	39	85	62
Senegal	71	15	90	44	n.a.	n.a.
Sierra Leone	17	8	58	21	90	20
East and Southern Africa						
Ethiopia	97	7	n.a.	n.a.	n.a.	n.a.
Kenya	69	81	n.a.	n.a.	n.a.	40
Lesotho	56	35	64	60	n.a.	n.a.
Madagascar	68	30	n.a.	n.a.	65	65
Uganda	75	55	60	36	99	42
Zambia	94	57	66	37	100	50
Zimbabwe	96	32	n.a.	n.a.	96	80
Asia and the Pacific						
Bangladesh	83	38	49	n.a.	n.a.	n.a.
Cambodia	n.a.	9	20	12	80	50
China	74	7	n.a.	n.a.	100	89
India	70	14	n.a.	82	100	80
Indonesia	77	49	87	57	n.a.	n.a.
Kazakhstan	100	98	n.a.	n.a.	n.a.	n.a.
Malaysia	94	94	100	86	n.a.	n.a.
Mongolia	99	74	100	68	n.a.	n.a.
Nepal	28	14	61	59	n.a.	n.a.
Pakistan	93	39	85	56	99	35
Philippines	89	63	91	81	77	74
Sri Lanka	68	62	88	65	n.a.	n.a.
Thailand	97	94	94	88	90	90
Viet Nam	43	15	n.a.	n.a.	100	80
Latin America and the Caribbean						
Bolivia	74	37	88	43	77	52
Brazil	80	30	80	28	n.a.	n.a.
Chile	90		99	47	n.a.	n.a.
Colombia	97	56	90	32	n.a.	n.a.
Costa Rica	95	70	100	99	100	63
Dominican Republic	76	83	88	55	84	67
Ecuador	95	49	81	10	70	20
Guatemala	95	74	97	48	47	25
Honduras	n.a.	57	91	66	80	56
Nicaragua	34	35	93	28	100	60
Panama	n.a.	n.a.	99	73	95	64
Paraguay	65	14	70	6	90	38
Peru	89	37	91	31	n.a.	n.a.
Trinidad and Tobago	99	98	100	88	100	99
Venezuela	64	30	79	79	n.a.	n.a.
Near East and North Africa						
Algeria	99	80	n.a.	n.a.	100	95
Morocco	94	24	97	20	100	50
Tunisia	96	52	100	76	100	80

a/ UNICEF 1999. b/ World Bank 1999b. c/ UNICEF 1996.

n.a. data not available.

Ethiopia, Niger and Sierra Leone, less than 10% of rural people had access to adequate sanitation in 1990-97.

Illiteracy among over-15s has considerably declined in almost all countries with both rural and urban data for at least two years since 1950 (Table 2.6). Yet over half the rural over-15s were illiterate in large

countries of Asia and Near East and North Africa during 1987-95. Despite much greater initial lack of rural schooling, the disparity has been widening. The odds ratio of rural-to-urban illiteracy risk rose between the 1970s and the 1990s for all eight countries in Asia with available data, for women, men and all adults; for almost all cases in Latin

Table 2.6: Illiteracy rates

	Year	Over 15s illiterate, percentage of population					
		Total		Male		Female	
		Urban	Rural	Urban	Rural	Urban	Rural
East and South Asia							
Bangladesh	1961	62.5	84.9	53.6	77.2	75.2	93.0
	1974	51.9	76.6	37.5	65.4	66.9	87.9
	1981	51.9	74.6	42.0	64.6	65.9	84.7
	1991	37.7	69.6	27.3	57.9	47.5	80.0
China	1982	17.6	37.8	9.5	23.1	26.4	53.2
	1990	12.0	26.2	6.1	15.7	18.4	37.1
India	1971	40.1	73.6	27.9	60.4	55.1	87.5
	1991 ^{a/}	26.7	55.3	18.9	42.1	35.9	69.4
Nepal	1981	52.6	81.3	40.3	70.4	67.0	92.4
	1995 ^{b/}	35.8	64.2	22.7	49.9	49.5	77.6
Pakistan	1961	63.3	84.2	52.6	74.7	78.9	94.6
	1981	52.6	83.2	43.1	73.9	64.1	93.4
	1994 ^{c/}	43.0	n.a.	n.a.	72.5	n.a.	n.a.
Philippines	1970 ^{c/}	7.2	21.3	6.0	19.8	8.2	22.8
	1990	2.7	10.3	2.4	9.6	3.0	11.0
Sri Lanka	1971	14.1	25.0	9.4	15.5	19.7	34.9
	1981	6.6	15.2	4.4	10.0	8.9	20.5
Thailand	1970	12.3	22.9	6.3	13.9	18.1	31.6
	1990	3.3	7.5	1.9	5.0	4.5	9.9
Latin America and the Caribbean							
Bolivia	1976	16.0	55.3	6.6	37.7	24.3	67.8
	1992	8.9	36.1	3.7	23.0	13.5	49.4
Brazil	1976	14.4	40.6	12.0	39.4	16.6	41.9
	1991	10.7	31.1	n.a.	n.a.	n.a.	n.a.
Costa Rica	1950	8.1	27.9	6.1	26.7	9.7	29.3
	1973	4.9	17.0	4.0	16.6	5.7	17.5
Guatemala	1973	28.2	68.6	20.0	59.9	35.5	77.6
	1994	16.8	47.8	11.2	38.5	21.6	56.9
Near East and North Africa							
Algeria	1971	58.8	81.1	42.0	66.5	74.2	94.0
	1987	42.9	71.2	29.5	55.8	56.2	87.2
Morocco	1971	61.3	88.5	45.6	78.1	75.8	98.7
	1994	41.1	79.3	27.7	65.5	53.8	92.3
Tunisia	1975	49.5	75.4	36.9	61.9	62.1	89.2
	1989	31.9	60.0	21.9	44.9	42.4	75.1

a/ over 7s. b/ over 6s. c/ over 10s. n.a. data not available.

Source: UNESCO Statistical Yearbooks, various years.

America; and for a substantial majority of cases in the three Near East and North Africa countries.⁷⁴ Comparable health data are few but, for 12 developing countries with available data, the ratio of rural to urban mortality among under-fives grew from 1.4:1 in the mid-1970s to 1.6:1 in the mid-1980s.⁷⁵

The uneven decline in rural poverty

Rural and urban areas differ in poverty levels as well (Annex Table 2.1). Comparisons are difficult because national poverty lines are used, and because of difficulties in setting urban and rural poverty lines and different definitions of 'urban'. But urban poverty is clearly lower than rural poverty. So is average depth of poverty.⁷⁶ Most country data use national poverty lines and are based on nationally determined nutritional requirements, with an assumption made about the share of non-food expenditure in the minimum necessary budget. Annex Table 2.2 summarizes the trends in rural-urban poverty, growth and income and sectoral distribution for countries for which such data is available. Here we present some broad conclusions (Table 2.7 provides a summary).

- Rural-urban poverty gaps remain wide in Latin America, in spite of much higher mean incomes than in Africa or South Asia, and some falls in rural and urban poverty. This is due partly to the choice of high national poverty lines but also to higher inequality.⁷⁷
- Faster falls in rural and urban poverty occurred in Asia, especially but not only East Asia, but region-wide ratios of rural to urban poverty have risen since 1985, especially in China.
- Most of Africa (except Ethiopia and Uganda) has seen little poverty reduction since the late 1970s but a fall in the exceptionally high ratios of rural to urban poverty.
- Rates of poverty reduction, and its responsiveness to faster economic growth, have been substantially lower since the late 1980s than in 1975-88.

- Sharp rises in poverty, especially in farming areas, have occurred in ten transitional countries since the late 1980s.⁷⁸ This reflects collapsing safety nets and a failure either to maintain subsidies to the poor within unreformed agriculture or to undertake egalitarian land reforms except in Albania, Armenia, Romania and Viet Nam.

These broad findings mask many regional variations in poverty trends. For instance, even though rural poverty has appreciably declined in China, parts of the north-west are still very poor. Overall there has been no global correction since the late 1970s of the urban biases that sentence rural people to more widespread and deeper poverty, illiteracy and ill-health. Only in sub-Saharan Africa, where the biases were greatest and then only for consumption poverty, have the disparities systematically lessened. Since the suppression of farm prices has declined with liberalization and globalization, it follows that other factors have turned against the rural poor.

Poverty, including rural poverty, fell sharply around 1975-88 and continues to fall, even if more slowly, for rural and urban people in much of Asia and some other areas. But the rural-urban gaps, which appear inefficient as well as inequitable, and which penalize rural areas where most of the poor still live, are not shrinking in most developing countries.

A relevant issue is how to reduce poverty by incorporating the rural and urban poor in manufacturing and services. Indonesia and China, like several smaller East Asian countries, have had some success, with poverty reduction continuing well after the agricultural workforce started to fall. The future of rural poverty, and of rural-urban disparity, is bound up with the capacity to educate and otherwise equip the children of the poor to make this enriching transition. Where this is neglected, long-term prospects for rural poverty and the rural-urban poverty disparity are

Table 2.7: Country classification of rural poverty trends

Rural poverty trend (1980-99)*	WCA	ESA	EAP	LAC	NENA	EE&FSU
No appreciable decline	Burkina Faso	Kenya	Bangladesh Cambodia Philippines	Peru		
Decline but still high	Mauritania	Zambia	Pakistan	Colombia Ecuador Guatemala Honduras		
Initial decline but running out of steam			India			
Appreciable decline		Ethiopia Uganda	China Indonesia Malaysia Sri Lanka		Morocco Tunisia	
Increase		Zimbabwe	Dominican Republic		Algeria	Kyrgyz Republic Romania
No clear trend	Nigeria					

* This is the broad period for which data is available. For individual countries, the period may vary.
Sources: See Annex Table 2.2.

bleak. For many Asian countries this is increasingly a problem of islands of regional poverty.

International aid and the rural poor

Aid⁷⁹ can reduce poverty in several ways. It can go to countries or to sectors, especially rural and agricultural, where poverty is widespread and severe. (This reaches the poor only to the extent that such aid is not fungible, i.e. that it does not mean less of other poverty-reducing resources, such as efforts by governments or private citizens, or flows of foreign investment.) Aid can be cost-effective against poverty within countries and sectors. And, even with weak sector and country allocation and cost-effectiveness, aid volume can be high enough to reduce poverty substantially.

Aid volume and poverty volume

Between 1987-88 and 1998 net aid disbursed in real terms fell from 0.33% to 0.24% of sharply

rising OECD Gross Domestic Product (GDP), the lowest proportion ever,⁸⁰ as against an agreed target of 0.7%. For low-income countries, net aid comprised only 1.4% of GNP, or USD 6.90 per person per year (down from 2.7% in 1992) per year. Aid is nevertheless very important for many countries with substantial poverty. In 1998, for sub-Saharan Africa (excluding South Africa and Nigeria), net aid disbursed was 8.6% of GNP, and for Latin America and the Caribbean 7.3% – respectively, about half and about a third of gross domestic investment. Yet South and East Asia,⁸¹ together containing two thirds of the world's dollar-poor, received only 25% of net aid disbursements, less than 1% of GNP and below one twentieth of gross domestic investment.⁸² By the late 1990s real net aid flows, especially to low-income countries in Asia, had fallen far below the volumes required to make major dents in poverty, despite donor commitments at the 1995 UN Social

Summit and in the Development Assistance Committee of the OECD in 1996 to manage aid around anti-poverty partnerships led by each developing country.

Yet in another sense aid is substantial relative to extreme poverty. We compared dollar poverty in the 47 countries with reliable surveys for various years around 1995, with net aid disbursed in the survey year.⁸³ In this sample, extra consumption needed to remove poverty for those consuming below PPP USD 1 a day was USD 106 billion a year. The total aid disbursements in the survey years to these same countries were USD 339.5 billion. With perfect targeting by donors to recipient countries, and by each country on its poor, aid disbursements would have covered 37% of the global dollar poverty gap.

Why then is aid at such levels too small to make a major poverty impact in many countries? Mainly because aid leaks into regions, countries and sectors with low poverty and/or little cost-effectiveness in reaching the poor.

Country aid allocation and poverty

The politics of country targeting undermines the impact of aid on poverty.⁸⁴ Bilateral aid is influ-

enced by commercial interests,⁸⁵ focuses still upon ex-colonies,⁸⁶ and hugely disfavours large countries even if they have massive poverty. Table 2.8 shows the weak congruence of aid with poverty at regional level.

Much aid goes to regions of quite high average real GDP and quite low poverty incidence. In both 1992 and 1998, 39% of net aid went to middle-income countries, the rest to low-income countries. South Asia and China receive a far lower proportion of aid than their low mean income and high share of world poverty would suggest; Latin America, the Confederation of Independent States, and the Near East and North Africa receive a far higher, and sub-Saharan Africa a somewhat higher, proportion.

This mismatch with poverty does not prove that aid is misallocated. Moderately poor countries or regions receiving large amounts of aid might be better at using aid to remove residual poverty than are worse-off and less-aided places. However, the low shares of world aid, and low aid per person, in 1998 in India (3.9% and USD 1.80) and China (5.7% and USD 1.90) are striking in view of their large shares of the world's extreme poor (over 400 and over 200 million, respectively, out

Table 2.8: Aid and extreme consumption poverty by main regions, 1998

Region	Persons consuming below 1993 PPP USD1/day			Net aid disbursements			GNP/person	
	No in mns	% of all dollar poor	Incidence of poverty in the region	USD mn	% of global	% of GNP		USD/person
All rcpt countries	1198.9	100.0	-	41102	100.0	2.9	8.3	-
All dvpg countries	>1188.9	>99.0	24.0	34449	83.8	3.2	7.5	1250
E/SE Asia, Pacific*	278.3	23.2	15.3	7794	18.9	0.7	3.0	1138
E Eur/Cent Asia	24.0	2.0	5.1	5565	13.5	0.7	14.0	2110
LAC	78.2	6.5	15.6	4388	10.7	7.3	8.8	3830
S Asia	552.0	43.6	40.0	5034	12.2	0.8	3.8	490
SS Africa	290.9	24.2	46.3	12580	30.6	4.4	21.4	530
Middle East/ North Africa**	5.5	0.5	1.9	4607	11.2	0.9	18.1	2220

Notes: * World Bank category. In the UNDP Human Development Report categories, of this, East Asia (including China) received USD 2678m aid (0.2% of GNP, USD 1.9 per person), SE Asia and the Pacific received USD 5516m (1.1%, USD 10.0). ** World Development Report category: Arab States receiving aid (in UNHDR categorization) corresponds very closely.

Source: World Bank 2000a: Fig. 1 and table 1.1; UN: P.2000: 205, 222.

of 1.2 billion)⁸⁷ together with their relatively good reputations for using aid to reduce poverty.

Focusing aid on poorer countries also means focusing it on countries with higher proportions of rural people and of the rural poor. In 2000, the proportion of persons mainly engaged in agriculture was 64% in sub-Saharan Africa and 55% in South Asia, but 41% in East and South-East Asia and only 21% in Latin America and the Caribbean.⁸⁸

Consistent with this, in our 47-country sample aid is very badly targeted on countries with high extreme-poverty gaps: a recipient country's proportion of gross aid disbursements bears almost no relation to its proportion of the world's 'dollar poverty gap' of around USD 106 billion in 1995. However, aid is somewhat less badly targeted on countries with a high proportion of the world's dollar-poor. The distinction between the two indicators lies in the depth of poverty. Country aid allocation appears to take some slight account of poverty numbers, but none of poverty depth. For example, Morocco, The Gambia and Algeria have roughly the same share of the world's poor people, but on average the poor in The Gambia are about 46 times poorer than the poor in Algeria and Morocco. Yet current allocations give far less aid to The Gambia than to Algeria and Morocco.

It is sometimes claimed that the high proportion of aid allocated to low-poverty countries matters little, in the sense that public spending falls to offset aid increases. It is odd to dismiss aid because its impact is felt partly in increased private, rather than public, spending. The evidence from a 38-country sample is that an extra dollar of aid increases public spending by 33 cents in the average case;⁸⁹ the increase, of course, would be far more in highly-aided and very poor countries such as Malawi, Mozambique or Nicaragua, where aid is about 30% of GNP and covers almost all public expenditure.

Sector allocation and poverty

The much lower cost per workplace in agriculture, and its tendency to employ the poor and increase the reliability of their food, suggest that giving aid to agriculture and rural development is good for the poor if it raises output. Indian evidence that only agricultural growth is associated with substantial poverty reduction supports this.⁹⁰

The proportion of sectorally allocable aid reaching agriculture, forestry and fisheries, which fell sharply from the mid-1970s to only 20.2% in 1987-89, plummeted further to 12.5% in 1996-98 (Annex Table 2.5), in contrast to the 52% of workforce (and presumably over two thirds of the poor) mainly dependent on agriculture for livelihoods. The real value of net aid disbursed to agriculture in the late 1990s was only 35% of its level in the late 1980s.

Aid is often fungible and hence bad at promoting particular economic policies even with alleged conditionality, though it is good at supporting countries that already have policies conducive to achieving good returns on aid.⁹⁵ These findings have coincided with an agreement among OECD donors to coordinate and subordinate their aid to monitored poverty targets, that is, halving dollar poverty in 1995-2015, and relevant funding gaps, identified by each developing country. Five years after this agreement, no such aid partnerships existed. In 2000 several have at last begun to take shape, principally under the aegis of World Bank/International Monetary Fund (IMF) Poverty Reduction Strategy Papers and the eight country strategies for halving poverty by the Asian Development Bank (ADB). This can contribute substantially to the ambitious targets of halving poverty in 1995-2015 only if aid concentrates much more on reducing rural poverty through stimulating agricultural growth and especially food production, yield and employment. It is on this that the poor depend for their work, income, health and poverty reduction; and it is here that dramatic progress has been possible. However, progress has stalled and is in dire need of revival.

Annex

Table 2.1: Rural-urban differences in poverty (country-specific poverty lines)

	Poverty Head Count Index			Poverty Gap Index	
	Rural	Urban	Rural-urban Ratio	Rural	Urban
West and Central Africa					
Burkina Faso 1994 ^w	51.1	10.4	4.91		
Burkina Faso 1998	50.7	15.8	3.21		
Cameroon 1984 ^w	32.4	44.4	0.73		
Chad 1985-6 ^w	67.0	63.0	1.06		
Ghana 1987-8 ^{cl}	41.9	27.4	1.53		
Ghana 1991-2	33.9	26.5	1.28		
Guinea-Bissau 1991 ^w	60.9	24.1	2.53		
Mauritania 1987 ^w	72.1	43.5	1.66		
Mauritania 1996	58.9	19.0	3.10		
Niger 1989-93 ^w	66.0	52.0	1.27		
Nigeria 1985 ^w	45.1	29.6	1.52		
Nigeria 1992	67.8	57.5	1.18		
Nigeria 1985 ^w	49.5	31.7	1.56		
Nigeria 1992	36.4	30.4	1.20		
Nigeria 1985 ^{cl}	16.1	4.9	3.29		
Nigeria 1992	15.4	10.9	1.41		
Senegal 1991 ^w	40.4	16.4	2.46		
Sierra Leone 1989 ^w	76.0	53.0	1.43		
East and Southern Africa					
Ethiopia 1989-95 ^w	61.3	40.9	1.50		
Ethiopia 1994-7	45.9	38.7	1.19		
Kenya 1992 ^w	46.4	29.3	1.58		
Kenya 1992 ^{cl}	46.3	29.3	1.59		
Kenya 1994	46.7	28.9	1.62		
Lesotho 1993 ^w	53.9	27.8	1.94		
Madagascar 1993-4 ^w	77.0	47.0	1.64		
Uganda 1992 ^w	59.4	29.4	2.02		
Uganda 1997	48.2	16.3	2.96		
Zambia 1991 ^w	88.0	46.0	1.91		
Zambia 1991 ^{cl}	79.1	27.2	2.91	50.1	9.5
Zambia 1996	74.9	34.0	2.20	37.8	11.4
Zimbabwe 1991 ^w	51.5	6.2	8.31		
Zimbabwe 1996	62.8	14.9	4.21		
Zimbabwe 1990-1 ^w	31.0	10.0	3.10		
East and South Asia					
Bangladesh 1983-4 ^{cl}	53.8	40.9	1.32	15.0	11.4
Bangladesh 1991-92	52.9	33.6	1.57	14.6	8.4
Bangladesh 1991-92 ^w	46.0	23.3	1.97		
Bangladesh 1995-96	39.8	14.3	2.78		
Cambodia 1993-4 ^w	43.1	24.8	1.74		
Cambodia 1997	40.1	21.1	1.90		
China 1978 ^{cl}	33.0	4.4	7.50		
China 1990	11.5	0.4	28.7		

(cont'd)

Rural-urban differences in poverty (country-specific poverty lines) (cont'd)

	Poverty Head Count Index			Poverty Gap Index	
	Rural	Urban	Rural-urban Ratio	Rural	Urban
China 1994 ^{bv}	11.8	<2			
China 1996	7.9	<2			
China 1998	4.6	<2			
China 1988 ^{ll}	22.6	2.7	8.37	7.2	0.4
China 1995	17.4	4.1	4.24	4.6	0.9
India 1992 ^{bv}	43.5	33.7	1.29		
India 1994	36.7	30.5	1.20		
India 1957-8 ^{bv}	55.2	47.8	1.15	19.0	16.0
India 1977-8	50.6	40.5	1.25	15.0	11.7
India 1987-8	38.9	35.6	1.09	10.0	9.3
India 1990-1	36.4	32.8	1.11	8.6	8.5
India 1994-5	34.2	28.4	1.20	8.7	7.1
India 1995-6	35.4	27.3	1.30	8.3	6.9
India 1997	34.2	27.9	1.23	8.1	7.2
Indonesia 1987 ^{bv}	16.4	20.1	0.81		
Indonesia 1990	14.3	16.8	0.85	2.1	3.2
Indonesia 1996	12.3	9.7	1.27		
Indonesia 1998	22.0	17.8	1.24		
Indonesia 1984 ^{cl}	45.7	15.9	3.87	12.8	3.5
Indonesia 1990	25.6	11.2	2.37	5.3	1.8
Lao PDR 1993 ^{bv}	53.0	24.0	2.21		
Malaysia 1973 ^{cl}	55.3	44.8	1.23		
Malaysia 1989	19.3	14.3	1.35		
Malaysia 1987 ^{dl}	24.7	7.3	3.39		
Mongolia 1995 ^{bv}	33.1	38.5	0.86		
Nepal 1995-6 ^{bv}	44.0	23.0	1.91		
Pakistan 1991 ^{bv}	36.9	28.0	1.32		
Pakistan 1984-5 ^{dl}	49.3	38.2	1.29		
Pakistan 1990-1	36.9	28.0	1.32	7.8	5.7
Philippines 1961 ^{cl}	64.0	51.0	1.25	19.0	13.9
Philippines 1988	53.0	23.0	2.30		
Philippines 1994 ^{bv}	53.1	28.0	1.90		
Philippines 1997	51.2	22.5	2.28		
Papua New Guinea 1996 ^{dl}	39.4	13.5	2.92	12.8	3.4
Sri Lanka 1985-6 ^{bv}	45.5	26.8	1.70	18.0	21.8
Sri Lanka 1990-1	38.1	28.4	1.34		
Sri Lanka 1985-6 ^{cl}	31.7	16.4	1.93	7.7	3.5
Sri Lanka 1990-1	24.4	18.3	1.33	5.3	4.1
Thailand 1992 ^{bv}	15.5	10.2	1.52		
Viet Nam 1993 ^{bv}	57.2	25.9	2.11		
Latin America and the Caribbean					
Bolivia 1996 ^{dl}	81.7	33.8	2.42	56.7	12.7
Brazil 1990 ^{bv}	32.6	13.1	2.49		
Brazil 1995 ^{dl}	41.5	13.2	3.14	20.0	6.5

(cont'd)

Rural-urban differences in poverty (country-specific poverty lines) (cont'd)

	Poverty Head Count Index			Poverty Gap Index	
	Rural	Urban	Rural-urban Ratio	Rural	Urban
Chile 1995 ^{af}	14.7	5.6	2.63	4.3	2.1
Colombia 1978 ^{af}	38.4	12.1	3.17	16.6	4.6
Colombia 1992	31.2	8.0	3.90	13.5	2.4
Dominican Republic 1989 ^{bf}	27.4	23.3	1.18		
Dominican Republic 1992	29.8	10.9	2.73		
Ecuador 1990 ^{cf}	85.0	47.7	1.78		
Ecuador 1994	47.0	25.0	1.88		
Guatemala 1980 ^{cf}	83.7	47.0	1.78		
Guatemala 1986-7	79.7	60.3	1.32		
Guatemala 1989 ^{bf}	71.9	33.7	2.13		
Honduras 1989 ^{cf}	58.0	51.0	1.14		
Honduras 1993	51.0	57.0	0.72		
Nicaragua 1993 ^{bf}	76.1	31.9	2.39		
Panama 1997 ^{bf}	64.9	15.3	4.24		
Paraguay 1991 ^{bf}	28.5	19.7	1.45		
Paraguay 1995 ^{bf}	45.3	7.5	6.04	21.5	3.0
Peru 1994 ^{bf}	67.0	46.1	1.45		
Peru 1997	64.7	40.4	1.60		
Trinidad and Tobago 1992 ^{bf}	20.0	24.0	0.83		
Venezuela 1995 ^{bf}	73.1	45.8	1.60	34.6	19.9
Near East and North Africa					
Algeria 1988 ^{bf}	16.6	7.3	2.27		
Algeria 1995	30.3	14.7	2.06		
Morocco 1984-5 ^{bf}	32.6	17.3	1.88		
Morocco 1990-1	18.0	7.6	2.37		
Tunisia 1985 ^{bf}	29.2	12.0	2.43		
Tunisia 1990	21.6	8.9	2.43		
Yemen 1992 ^{bf}	19.2	18.6	1.03		
Eastern Europe and Former Soviet Union					
Estonia 1994 ^{bf}	14.7	6.8	2.16		
Georgia 1997 ^{bf}	9.9	12.1	0.82		
Kazakhstan 1996 ^{bf}	39.0	30.0	1.30		
Kyrgyz Republic 1993 ^{bf}	48.1	28.7	1.68		
Kyrgyz Republic 1997	64.5	28.5	2.26		
Romania 1989 ^{bf}	5.9	1.2	4.92		
Romania 1993	23.4	17.0	1.38		

Sources:

- a/ Demery 1999: data given in World Bank 2000a.
- b/ World Bank 2000b.
- c/ Lipton and Eastwood 1999: Table III.1 - see below for original sources.
- d/ de Haan and Lipton 1999: Table 4 - see below for original sources.
- e/ Wodon 1999: Table 1.9, World Bank staff estimates.
- f/ Khan 1998: Tables 6 and 10.
- g/ Jha 1999: Table 4.

Lipton and Eastwood 1999, original sources:

- Ghana: World Bank 1995a: 27.
- Nigeria: World Bank 1996a: 22-6.
- Kenya: Ayako and Katumanga 1997: 7.
- Zambia: McCulloch and Baulch 1999.
- Bangladesh: Iyengar et al. 1996: 60.
- China: World Bank 1992b: ix, 23, 146-7.
- Indonesia: Iyengar et al. 1996: 60.
- Malaysia: de Haan and Lipton 1999 and Shari 1992 (NB: data not the same as in Lipton and Eastwood).
- Philippines: World Bank 1995f: 3.
- Sri Lanka: World Bank 1995g: 7.
- Colombia: World Bank 1994b: 6.
- Ecuador: World Bank 1995h, Vol. 2: 7.
- Guatemala: World Bank 1995b, Annex 2: Table 1, data originally from CEPAL.
- Honduras: World Bank 1994c, Appendix: Table C12.

de Haan and Lipton 1999 - original sources:

- Malaysia: Ahuja et al. 1997: 14-15.
- Pakistan: World Bank 1995i: 52.
- Papua New Guinea: Ahuja et al. 1997: 14-15.

Notes:

(1) The poverty line

All data from Demery (1999), Wodon (1999), Khan (1998) and Jha (1999) are for national poverty lines. These are based on nationally determined nutritional requirements, with an assumption made about the share of non-food expenditure in the minimum necessary budget. This is also true of all data from Lipton and Eastwood (1999) and de Haan and Lipton (1999) with the following exceptions: for Nigeria, the poverty line is set at one third of mean per capita household expenditure; for Ghana, the poverty line is two thirds of mean per capita expenditure in the first year of the survey 1987-8; for Indonesia, the poverty line is USD 30 a day adjusted to PPP; for Guatemala and Malaysia, the nature of the poverty line is not given in the source.

Data from the World Bank (2000b) are for a national poverty line, but it is not clear how this is calculated in each case.

Malaysia data given in Lipton and Eastwood (1999) appear to be for poverty incidence of households, rather than a headcount. In all other cases the data are headcount data.

(2) Income or expenditure?

Poverty rates presented are based on income with the following exceptions:

Wodon (1999) and Jha (1999) are based on expenditure.

From Lipton and Eastwood (1999), data for Ghana, Nigeria, Kenya and Sri Lanka are based on expenditure. Ecuador data are based on income for 1990 and expenditure for 1994.

From de Haan and Lipton (1999), data for Pakistan and Papua New Guinea are based on consumption.

In a number of other cases, including all data from the World Bank (2000b), and data for Indonesia and Bangladesh in Lipton and Eastwood (1999), it is not clear whether income or expenditure is taken as the measure of household living standards.

(3) Definitions of urban and rural

The definitions of urban and rural used in each source are not clear. Almost all sources use a different poverty line for urban and rural areas, reflecting both different nutritional requirements and differences in the cost of living. Ghana is an exception.

It follows from the above that data cannot be compared across sources. However the aim has been to provide more than one data point from a single source. Exceptions: data for Ecuador are from two different studies and use different measures of household living standards in each case.

Table 2.2: Poverty trends and profiles, with growth and redistribution

ASIA AND THE PACIFIC (AP)			
Country	Period	Poverty Trends ^{1/}	Growth Performance ^{2/}
Bangladesh	1984-96	Sharp decline in rural Head Count Index (HCI); urban HCI fell faster so increase in rural-urban ratios.	Increase in output rates in 1980s and 1990s, but below target rate of 7% recommended for sustainable poverty reduction.
Cambodia	1993-4 to 1997	Decline in both urban and rural poverty. Slightly increased rural-urban HCI ratio.	Despite an increase in industrial output and tourism, agriculture is key to growth. But it is vulnerable to bad weather such as floods in 1996 which slowed growth.
China	1978-95	Decline in both rural and urban poverty in 1977-84, though urban poverty fell faster. Nearly fourfold increase in rural-urban HCI ratio in 1978-90. Rural poverty increased in 1985-9 and then decreased from 1990.	Economic reform resulted in high rates of growth, enabling large investments in social welfare.
India	1970-89	Faster decline in rural HCI than urban leading to a decline in rural-urban Poverty Gap Index (PGI) ratio.	Whereas the Green Revolution resulted in growth of agricultural output, manufacturing output suffered a bottleneck in the 1970s and 1980s.
Indonesia	1976-95	Fast falls, especially in rural poverty, led to a decline in rural-urban PGI ratio (1984-90).	Agriculture gained importance after the oil crisis in 1973; manufacturing suffered in the 1970s but has since achieved higher growth rates than agriculture.
Kazakhstan	1996	Trend data not available. Rural HCI higher than urban HCI.	Output stabilized in 1996 for the first time since independence. Good outlook as industry geared towards developing the natural resource base [World Bank ^{3/}].
Kyrgyz Republic	1993-7	Increase in rural poverty, but decrease in urban poverty leading to an increase in rural-urban HCI ratio.	Data not available for this period.
Lao PDR	1993	Trend data not available. In 1993 rural HCI more than twice that of urban HCI.	Primarily a subsistence economy with slow growth.
Malaysia	1970-90	Both rural and urban poverty declined but at varying rates so poverty indicators diverged (1973-89).	Varied growth performance – a general slump in the early 1980s, but agricultural growth in 1976-87. Significant growth since 1987.

Redistribution

Poverty Profile^{3/}

Increase in rural-urban, intra-sectoral and overall inequality.

In spite of decline in both, rural poverty incidence still higher than urban. Large variations in poverty rate by geographical area. Landlessness the foremost determinant of rural poverty.

Sharp fall in urban-rural inequality from 1978-83 with quasi-privatization of farmland. Moderate fall in urban inequality as well. Substantial rises in total, intra- and intersectoral inequalities in 1983-95 as the focus of reform shifted to the urban sector.

Rising rural-urban poverty ratios reinforced by rising intra-rural inequality after 1983 as township & village enterprises replaced agriculture as engine of rural growth.

Little change in urban-rural inequality; small rise in urban inequality; small decline in rural inequality.

Poverty is mainly rural. Gender, literacy, land ownership, employment status, caste and location closely associated with poverty.

Rises in rural, urban and rural-urban inequalities in 1976-78; A steady fall in the rural Gini but a U-shaped pattern for urban and overall Ginis since 1978.

Poverty is mainly rural but with large regional disparities.

Poverty concentrated in the south of the country, in large households and among the unemployed and pensioners.

Poverty fundamentally a rural phenomenon. Nearly 80% of the poor live in rural areas and the gap between urban and rural areas is growing.

Large urban-rural differential in poverty. Poverty is higher in the South, coincident with unfavourable nutrition and health indicators.

Falling total, inter-sectoral and urban inequalities; small rise in total inequality in the 1970s associated with a temporary rise in rural inequality.

(cont'd)

Poverty trends and profiles, with growth and redistribution

ASIA AND THE PACIFIC (AP) (cont'd)

Country	Period	Poverty Trends ^{1/}	Growth Performance ^{2/}
Mongolia	1995	Trend data not available. In 1995 urban HCI was slightly higher than that of rural HCI.	Liberalization boosted small-scale agricultural output and industry recovered after a decline in the early 1990s. Growth since 1994.
Nepal	1995-6	Trend data not available. In 1995/6 rural HCI was nearly twice that of urban HCI.	Good, stable GDP growth, but contribution of agriculture is declining due to weather and increasing importance of non-agricultural sectors.
Pakistan	1979-91	Rate of reduction of urban HCI no faster than rural HCI in 1984/5-1990/1.	Good growth performance resulting in food grain self-sufficiency and increased government development expenditure.
Papua New Guinea	1996	Trend data not available. Rural HCI nearly three times that of urban HCI in 1996.	Disappointing economic performance due to dependency on minerals sector and agriculture vulnerable to weather conditions such as <i>El Niño</i> .
Philippines	1957-91	Rural-urban ratios of both HCI and PGI increased as urban poverty fell faster (1961-88).	Industrialization in the 1980s, but more recently the agricultural sector has received more attention to improve output.
Sri Lanka	1970-91	Decline in rural HCI and PGI, but urban indices increased in 1985/6-1990/1	Liberalization in the late 1970s led to increased public investment in agricultural development, irrigation, etc.
Thailand	1962-92	Trend data not available. In 1992 rural HCI was higher than urban HCI with rural-urban HCI ratio of 1.52.	Rapid industrial growth since the 1960s, but agriculture is still important in GDP growth.
Viet Nam	1993	Trend data not available. Rural HCI more than twice as large as urban HCI.	Survived economic transition well, with rapid economic growth. Industrial growth above target, but declining agricultural sector, despite its high employment.

Redistribution

Poverty Profile^{2/}

Incidence and depth of poverty, along with social indicators, worse in rural than in urban areas; in remote than in more inaccessible rural areas; for women, and for people belonging to certain occupational castes.

Insignificant changes in overall, intra-rural and rural-urban inequality in 1979-85/6. Substantial annual fall in rural-urban inequality in 1985-6 to 1990-1 partly offset by rises in urban and rural Ginis leading to a sharp rise in overall Gini, despite rural-urban equalization.

Rural areas have higher poverty and worse human development indicators than urban areas. Among regions, rural South Punjab and Baluchistan poor relative to other provinces.

An inverted U-pattern for rural, urban and total inequality during the mid-1950s to mid-1980s. Sharp narrowing of the urban-rural gap during the mid-1960s to the mid-1970s. All components of inequality turned upwards since then.

Mainly rural. Most of the poor are engaged in the agriculture, fisheries and forestry sectors.

Fall in urban-rural and rural inequalities; urban inequality unchanged.

Poverty is mainly rural. Individuals are more likely to be poor if working members of the household are employed in agriculture.

A large rise in urban-rural inequality (73%) in 1981-92.

Most of the poor lived in the northeast and the north and the bulk of the poor are concentrated in rural areas. Poor households are mainly involved in agriculture.

A large majority of the poor, concentrated in rural areas, are farmers. The highest incidence of poverty is found in the North Central Coast. Ethnic minorities have a higher incidence of poverty than the national average.

Poverty trends and profiles, with growth and redistribution

WEST AND CENTRAL AFRICA (WCA)

Country	Period	Poverty Trends ^{1/}	Growth Performance ^{2/}
Burkina Faso	1994-8	Decline in rural poverty, increase in urban leading to a decrease in the rural-urban HCI ratio.	Year-to-year fluctuations due to rain-fed agriculture. Limited manufacturing growth because of lack of raw materials and the need to import fuel.
Cameroon	1984	Trend data not available. Higher urban HCI than rural HCI.	Good growth until 1985 when oil, coffee and cocoa prices declined.
Chad	1985-6	Trend data not available. Rural and urban HCI roughly equal.	An agrarian economy reliant on rains, which has stunted economic growth.
Ghana	1988-92	Big fall in the ratio of rural-urban poverty.	Growth low but constant; growth in output of food crops despite drought.
Guinea-Bissau	1991	Trend data not available. Rural HCI over twice as high as urban HCI.	Fluctuating growth due to reliance on agricultural sector.
Mauritania	1987-96	Both urban and rural poverty has declined, but urban poverty has fallen faster, resulting in a doubling of rural-urban HCI ratio.	Dual economy with a small modern sector and a traditional subsistence sector vulnerable to climate change. Growth has slowed.
Niger	1989-93	Trend data not available. Rural HCI slightly higher than urban HCI.	Good rains in 1988 and 1990 led to good growth; mineral sector suffered when world uranium prices depressed.
Nigeria	1985-92	Fall in rural poverty, increase in urban poverty leading to a decrease in rural-urban HCI ratios.	Steady increase in GDP due to recovery of oil prices and economic reform in the agricultural sector. Heavily dependent on oil prices.
Senegal	1991	Trend data not available. Rural HCI more than twice as high as urban HCI.	Economy recovered in 1990 after a poor farming season in 1988-9. Affected by poor groundnut harvest in 1990-91.
Sierra Leone	1989	Trend data not available. Higher rural than urban HCI.	Negative growth due to a large agricultural subsistence sector and decline of the mineral sector.

Redistribution

Poverty Profile^{3/}

Rise in urban inequality offset by falls in rural and rural-urban inequality.

The poor are concentrated in rural areas. Geographic location is a strong indicator of poverty.

More than four fifths of the population and an even larger proportion of the poor live in rural areas.

Poverty is mainly rural but the gap with urban poverty is narrowing. Whole communities in the northern areas of Ghana are poor while poverty is lowest in the capital, Accra. Gender is an important dimension of poverty in Ghana, especially in the Northern Region.

Poverty is an overwhelmingly rural problem, with most of the poor living in the regions of Rural Norte, Rural Leste and Rural Sul.

Poverty appears more severe in rural areas (particularly in the east and the Senegal River Valley) than in urban areas. Nearly 30% of Mauritanian households are headed by women, partly explained by high divorce rates and increasing long-term migration.

Because of the population weighting, rural areas contribute more than urban areas to total poverty.

Mainly rural, but the share of urban poverty is increasing. The largest number of poor people is concentrated in northern regions.

Poverty in Senegal essentially a rural phenomenon, with over 80% of poor households living in rural areas.

Sierra Leone is one of the poorest countries in the world. In 1992, it had a per capita income of only USD 170. The great majority of the poor live in rural areas. Social indicators are among the worst in the world. Life expectancy is only 42 years, the second lowest in the world.

Poverty trends and profiles, with growth and redistribution

EAST AND SOUTHERN AFRICA (ESA)

Country	Period	Poverty Trends ^{1/}	Growth Performance ^{2/}
Ethiopia	1989-95 to 1994-7	Greater decline in rural than urban poverty leading to decline in rural-urban HCI.	Largely an agricultural economy, growth dependent on rainfall. High output in 1992, a wet year, but since then low growth due to civil war.
Kenya	1992-4	Fall in the ratio of rural-urban HCI.	Negligible growth due to lack of rainfall, political disorder and foreign exchange crisis. Export smallholders successful, but high inequality of landholding has worsened conditions for the poor.
Lesotho	1993	Trend data not available. Rural HCI almost twice as high as urban HCI.	Manufacturing output strong. Reliant on remittances from migrant miners. Declining agricultural yields due to soil erosion and poor farming practices.
Madagascar	1993-4	Trend data not available. Rural HCI much higher than urban HCI.	Slow recovery after sluggish growth in the 1980s. Agriculture's share of GDP declining.
Uganda	1992-97	Greater decline in urban than rural poverty, resulting in an increase in rural-urban HCI.	Good growth performance due to improved security, but agricultural output strongly affected by drought.
Zambia	1991-6	Rural poverty fell while urban poverty increased; small decline in rural-urban HCI, larger fall in PGI.	Liberalization, investment in industry has been low resulting in negative growth rates.
Zimbabwe	1991-6	Increase in both urban and rural poverty, but urban most significant, resulting in halving of rural-urban HCI ratio.	Erratic growth pattern due to droughts affecting agriculture, but industrial growth significant and constant.

Redistribution**Poverty Profile^{2/}**

Landless, refugees, those displaced due to war and demobilized soldiers are an important component of the poor in Ethiopia. Poverty is mainly rural.

The majority of the poor in rural areas are food and subsistence farmers and those who derive the bulk of their income from the informal sector. About one third of rural poor households are headed by widowed, divorced, or separated women with children.

Poverty mainly a rural phenomenon and the incidence is disproportionately high among households engaged in agriculture, informal business or casual labour. Boys suffer more than girls from higher malnutrition rate and lower school enrollment ratios.

Poverty is deeper in rural than in urban areas. Farmers (especially smallholders) are the poorest group in the country. Most of the poor are seven to 20 years old who do not attend school.

Rural poverty incidence and severity higher than in urban areas. Correlates of poverty (such as household size, dependency ratio and illiteracy) are higher for rural Uganda. Poor households tend to have older, less educated and (more likely) a woman as head of the household.

Rises in intra-rural equality

Rural poverty more prevalent, deeper and more severe than urban poverty. Increased likelihood of poverty in remote provinces and especially severe in remote districts.

Overwhelming majority of the poor live in rural areas. Poverty is most common and deepest in the low rainfall areas of Matabeleland South, Masvingo and Matabeleland North provinces.

Poverty trends and profiles, with growth and redistribution

LATIN AMERICA AND THE CARIBBEAN (LAC)

Country	Period	Poverty Trends ^{1/}	Growth Performance ^{2/}
Bolivia	1996	Trend data not available. Rural HCI more than twice that of urban HCI.	Agriculture a major engine of growth. Economic output increasing, but below target of 5.6% recommended for meaningful reduction in poverty.
Brazil	1981-95	Increases in rural and urban poverty (1990-95); greater increase in rural areas leading to an increase in rural-urban PGI ratio (1990-95).	Negative growth in early 1980s. Revival of growth by 1984, but recession once again in early 1990s. Agricultural sector largely neglected.
Chile	1987-94	Trend data not available. In 1995 rural HCI was almost three times higher than urban HCI.	High rates of growth in late 1980s, but slowed in 1990 due to anti-inflationary measures.
Colombia	1978-92	Decline in rural and urban poverty, but an increase in rural-urban HCI.	Stable growth. Agricultural growth has been negligible, with a poor performance in the 1990s due to trade liberalization.
Dominican Republic	1989-92	Increase in rural poverty, but sharp decline in urban poverty; twofold increase in rural-urban HCI.	Erratic growth with construction, tourism and communications being important engines.
Ecuador	1990-94	Sharp decline in both urban and rural poverty with a negligible increase in rural-urban HCI.	Trade liberalization caused tough competition for local manufacturers.
Guatemala	1980-1986/7	Decrease in rural poverty, increase in urban poverty.	Stagnation in early 1980s due to a drop in export prices and left-wing insurgency. Agriculture worse hit than industry.
Honduras	1989-93	Decline in rural poverty, increase in urban poverty leading to a decline in rural-urban PGI ratio.	Steady growth in output; manufacturing performance weaker than agricultural.
Nicaragua	1993	Trend data not available. Rural HCI more than twice that of urban HCI.	Agriculture recovered better than industry in the early 1990s after economic decline in the 1980s.



Redistribution	Poverty Profile ²¹
Rising inequality in 1981-90. Sharp decline in rural-urban inequality, though no change in rural inequality in 1990-95. Overall rise in inequality 10-20% in urban and rural sectors.	Poverty associated with a low level of education and more common among the indigenous population. In rural areas the poor are generally agricultural labourers or wage-earners with limited landholdings and no access to credit and basic infrastructure.
Inequality trend similar to Brazil. Sharp fall in urban sector inequality, large enough to swamp rising rural inequality.	More than half of all poor Brazilians live in the northeast. In spite of urbanization, rural and urban areas contribute equally to national poverty. Poverty disproportionately affects the young and a quarter of children under the age of five suffer from chronic malnutrition.
	More than three out of four poor people live in rural areas. The rural poor are poorer than the urban poor. Important regional differences.
	In 1992, rural poverty was almost three times urban poverty, and more than one in four children lived in poverty.
	Poverty is higher in rural areas and among the indigenous people, especially those who live in the rural highlands (Sierra) and the Amazon region, than for the non-indigenous population.
	Poverty is especially prevalent in rural areas in the north, northwest and southwest and occurs primarily among the poorly educated and indigenous members of the population. More than 90% indigenous population is poor.
Rise in both urban and rural inequality. Decline in inter-sector inequality.	Poverty is mainly rural.
	Poverty is mainly concentrated in rural areas and the northern regions (Jinotega and Matagalpa) and the Segovias (Esteli, Madriz, and Nueva Segovia).

(cont'd)

Poverty trends and profiles, with growth and redistribution

LATIN AMERICA AND THE CARIBBEAN (LAC) (cont'd)

Country	Period	Poverty Trends ¹	Growth Performance ²
Panama	1997	Trend data not available. Rural HCI more than four times greater than urban HCI.	Growth due to exports and service sectors. Agriculture and manufacturing slow to adjust to international competition. Agriculture affected by El Nino.
Paraguay	1991-5	Massive increase in rural HCI, decrease in urban HCI leading to a fourfold increase in rural-urban HCI ratio.	Positive growth, but heavily dependent on agriculture, vulnerable to weather conditions and international commodity market [World Bank ³].
Peru	1994-7	Decline in poverty greater in urban than rural areas leading to a slight increase in rural-urban HCI.	Strong investment-led economic recovery in mid 1990s. Boom 1993-5 due to dismantling of guerrilla groups and increased mining revenue, but agriculture hit by El Nino in 1997.
Trinidad and Tobago	1992	Trend data not available. Urban HCI slightly higher than rural HCI.	Recession in 1992-3 due to falling oil production.
Venezuela	1995	Trend data not available. Higher rural HCI than urban HCI.	Dependent on oil prices, manufacturing important. Agricultural decline since 1950s when oil extraction started.

Redistribution

Poverty Profile^M

Poverty concentrated in rural areas, especially in indigenous areas.

Poverty relatively more prevalent in small cities and in rural areas, and associated with low education levels, female-headed households, language (monolingual Guarani speakers) and migration.

Poverty particularly high among the indigenous population. The poor are found largely among two occupational groups – the self-employed and private sector workers. Working in agriculture positively associated with poverty.

Poverty is evenly divided between urban and rural areas, though the severity of poverty is worse in urban areas, with high criminality.

Poverty trends and profiles, with growth and redistribution

NEAR EAST AND NORTH AFRICA (NENA)

Country	Period	Poverty Trends ^{1/}	Growth Performance ^{2/}
Algeria	1988-95	A doubling of both urban and rural poverty.	Negative growth due to collapse in oil prices in 1985. Improvement since 1995.
Estonia	1994	Trend data not available. Rural HCI more than twice as high as urban HCI.	Economic recovery began in 1994 after independence in 1991.
Georgia	1997	Trend data not available. Urban HCI higher than rural HCI.	Decline in GDP growth in early 1990s, but picked up again in 1994-7 with small-scale privatization, and a law on the ownership of agricultural land, and the freeing of bread prices stimulating wheat production [IFAD 1999c].
Jordan	1984-5 to 1990-91	Increases in both urban and rural poverty; greater increase in rural areas 1986-92.	Massive decline in output over this period, worsened by the Gulf Crisis.
Morocco	1984-5 to 1990-91	Decline in both urban and rural poverty, but urban poverty fell faster leading to an increase in rural-urban HCI ratio.	Improvements in growth performance when five year drought ended in 1985; but being an agricultural economy, growth erratic due to susceptibility to drought.
Romania	1989-93	Rapid increases in urban and rural poverty; urban poverty worse than rural, hence a reduction in rural-urban HCI ratio.	Negative growth after 1989 revolution. Macroeconomic programme in 1993 caused positive growth thereafter [IFAD 1999c].
Tunisia	1985-90	Decline in both urban and rural poverty. No change in rural-urban HCI ratio.	Growth in manufacturing sector, but 1986 drought, locusts and regional tensions cause problems for agriculture and tourism.
Yemen	1992	Trend data not available. Rural HCI slightly higher than urban HCI.	Data not available.

Note: HCI refers to headcount index or the incidence of poverty which is the number of poor people divided by the population.

Sources: 1) Refer to Annex Table 1.1.

2) Growth performance are taken from Economist Intelligence Unit Country Profiles unless otherwise stated.

3) World Bank website <http://www.worldbank.org/html/extdr/regions.htm>



Redistribution	Poverty Profile ^{3/}
	Most of the poor live in rural areas, but the share of the urban poor has increased.
	Rural poverty tends to be more severe than urban poverty. Rural poor households have little or no formal income, i.e. those with unemployed and underemployed members.
	Urban poverty is more widespread, deeper and more severe than rural poverty, concentrated in some regions and among those unable to work (the inactive, elderly or disabled) or the unemployed.
Sharp rises in rural and urban inequalities.	High inequality of access by gender to economic opportunities. The incidence of poverty is higher in rural areas but only one third of the poor live in rural areas.
Overall flat inequality with a slight fall in urban inequality.	Poverty is primarily a rural phenomenon.
	Nearly half of the poor live with wage earners and the unemployed, while the rest reside in farm and pensioner households. Highest incidence of poverty among households headed by the unemployed and by farmers.
	Poverty remains primarily a rural phenomenon. There is a marked disparity in poverty among regions: the north-west and the centre-west have the highest incidence of poverty.
	Rural and urban HCI are roughly equal.

Table 2.3: Age-structure and ratio of persons aged 15-59 to others, 1959-2030

	1950			1960			1970			1980		
	<15	60+	R	<15	60+	R	<15	60+	R	<15	60+	R
WCA												
DR Congo	43.6	5.6	1.03	44.0	4.7	1.05	44.3	4.5	1.05	45.1	4.6	1.01
Ghana	45.1	4.1	1.03	45.5	4.2	1.01	45.5	4.4	1.00	44.9	4.5	1.03
Nigeria	45.7	4.0	1.01	42.9	4.1	1.13	44.4	0.98	1.06	46.2	4.3	0.97
ESA												
Ethiopia	44.2	4.6	1.05	44.5	4.1	1.06	45.0	4.3	1.03	46.6	4.8	0.95
Kenya	39.8	6.3	1.17	45.6	6.4	0.92	48.1	5.9	0.85	50.1	5.0	0.81
Tanzania	46.0	3.8	1.01	47.9	3.8	0.93	46.8	4.0	0.97	47.6	3.8	0.95
AP												
Bangladesh	37.6	6.2	1.28	40.9	6.2	1.12	45.4	6.1	0.95	46.7	5.3	0.92
China	32.5	7.5	1.54	38.9	7.2	1.17	39.7	6.8	1.15	35.5	7.4	1.33
India	38.9	5.6	1.22	39.8	5.7	1.22	40.6	6.0	1.15	38.5	6.5	1.22
Indonesia	38.7	6.2	1.23	40.1	5.2	1.21	42.2	5.2	1.09	40.8	5.3	1.17
Malaysia	40.9	7.3	1.07	44.3	5.3	1.01	44.6	5.5	1.00	39.6	5.7	1.21
Myanmar	37.8	5.5	1.31	41.1	5.6	1.14	41.2	6.1	1.11	39.6	6.4	1.17
Pakistan	37.8	8.2	1.20	41.9	8.3	0.99	46.3	5.0	0.95	44.4	4.6	1.04
Philippines	43.6	5.6	1.03	46.7	4.9	0.94	45.4	4.3	1.01	41.9	4.5	1.15
LAC												
Brazil	41.7	4.9	1.15	43.2	5.3	1.06	42.3	5.7	1.05	38.1	6.2	1.26
Colombia	42.6	5.0	1.10	46.4	5.0	0.95	45.8	5.4	0.95	42.7	5.7	1.07
Mexico	42.0	7.1	1.04	45.0	8.9	0.86	46.5	6.1	0.91	45.0	5.4	0.98
NENA												
Iran	39.1	8.3	1.11	44.8	6.3	1.11	45.7	5.4	0.96	44.9	5.1	1.06
Iraq	44.8	4.3	1.04	46.1	4.0	1.00	46.6	4.0	0.98	46.0	4.3	0.99

Notes: <15: percentage of population aged 0 to 14. 60+: percentage of population aged 60 or over. R: persons aged 15-59 as a proportion of persons aged below 15 or over 60 (prime-age dependency ratio). R stops falling and starts rising - due to ageing of 'cohorts' saved from child mortality and to falling fertility - between 1970 and 1980 in Brazil, China, Colombia, India, Indonesia, Kenya, Malaysia, Myanmar, Pakistan and the Philippines; between 1980 and 1990 in Bangladesh, Iraq, Kenya and Tanzania; 1990-2000 in Ghana, Iran and Nigeria; and 2000-2015 in DR Congo and Ethiopia. R stops rising and starts falling (due to the impact of the rising proportion of over-60s) only in some countries before 2030, and there not before 2015: Brazil, China, Colombia, India, Indonesia, Iran, Malaysia, Mexico, and Myanmar.

Source: UN (1999) Data from 2000 are medium projections.

1990			2000			2015			2030		
<15	60+	R	<15	60+	R	<15	60+	R	<15	60+	R
47.3	4.6	0.93	48.3	4.4	0.88	44.3	4.3	1.06	39.1	4.9	1.27
45.3	4.6	1.00	43.1	5.1	1.07	38.5	5.9	1.25	32.0	7.6	1.53
46.4	4.5	0.96	45.1	5.0	1.00	39.2	5.0	1.26	32.5	6.5	1.56
45.4	4.7	1.00	46.2	4.5	0.97	43.7	4.2	1.09	37.7	4.9	1.35
49.2	4.5	0.86	43.0	4.3	1.11	35.8	3.9	1.52	26.6	6.0	2.07
46.5	4.1	0.98	45.4	4.1	1.02	41.3	4.0	1.21	34.1	5.0	1.56
44.3	4.9	1.03	35.1	5.1	1.49	28.1	6.9	1.86	23.0	6.7	2.36
27.4	8.1	1.82	24.9	10.1	1.86	19.6	14.7	1.92	17.1	23.2	1.73
33.4	6.9	1.48	33.3	7.6	1.44	25.7	11.1	1.72	22.2	14.2	1.73
38.7	6.3	1.22	30.7	7.5	1.62	24.6	8.7	2.02	22.0	14.9	1.71
36.5	5.8	1.36	34.0	6.6	1.46	25.4	10.1	1.82	22.8	15.2	1.56
35.6	6.4	1.38	31.7	7.6	1.54	24.0	9.4	1.99	20.8	15.9	1.72
43.1	4.7	1.09	41.8	4.9	1.14	35.2	6.3	1.41	26.4	4.9	1.76
41.4	5.3	1.13	36.7	5.7	1.36	32.0	6.9	1.57	23.5	8.4	2.13
34.8	6.7	1.41	28.8	7.8	1.73	24.3	11.1	1.82	21.6	16.8	1.60
36.0	6.3	1.36	32.7	6.9	1.52	27.0	8.9	1.79	22.7	15.8	1.60
38.6	5.9	1.26	36.2	6.9	1.43	26.1	10.9	1.77	22.1	15.9	1.63
45.5	5.7	0.95	36.1	6.3	1.36	26.7	7.5	1.92	22.9	12.0	1.87
44.2	4.5	1.05	41.3	4.9	1.16	36.8	6.1	1.33	27.8	8.8	1.73

Table 2.4: Summary of research on poverty dynamics and main findings

Country	Dataset(s)	Sample size	Time span of panel(s)	No. of waves in panel(s)
Burkina Faso ^{1/}	Rural Burkina Faso – ICRISAT	150 households	1983-4 to 1984-5	2
Chile ^{2/}	Rural Chile – authors	146 households	1968-86	2
China ^{3/}	South-West Rural China – State Statistical Bureau	38 000 individuals	1985-90	6
Côte d'Ivoire ^{4/}	Cote d'Ivoire Living Standards Measurements Surveys – World Bank	700 households	1985-6, 1986-7 and 1987-8	2
Ethiopia ^{5/}	Rural Ethiopia – Universities of Addis Ababa and Oxford	1 411 households	1994-5	3
Hungary ^{6/}	Various ^{a/}	1 744-5 945 households	1992-6 and 1987-9	2, 5
India ^{7/}	Various ^{b/}	100-4 118 households	1957-8 to 1984	3, 4, 8, 9
Indonesia ^{8/}	Indonesia – RAND Corp., University of California, Los Angeles and University of Indonesia	30 000 individuals	1993-94 to 1998	3 ^{d/}
Pakistan ^{9/}	Rural Pakistan – International Food Policy Research Institute (IFPRI)	686-727 households	1986-89, 1986-91	12, 5

Form(s) of study	Welfare indicator(s)	Main findings
Impact of agro-climatic shocks on poverty dynamics	Income	Off-farm income increases inequality after a severe drought.
Mobility across poverty classes, trends in inequality	Income	More households moved out of poverty than into it. Chronic poverty strongly associated with residence in semi-arid region, being an ethnic minority, losing livestock and living in a large household. Upwards income inequality is greater the poorer the household. Inequality declined due to increased coverage of targeted public transfers.
Estimating, targeting and determinants of transient and chronic poverty	Consumption	Consumption variability accounts for a large share of poverty. Anti-poverty policies need greater emphasis on transient poverty.
Mobility across poverty classes; determinants of changes in household per capita expenditure levels	Expenditure	Very few, even the poorest, improved their standard of living amid general decline. In some socio-economic groups, the poor had a greater chance of escaping poverty. In rural areas, physical capital significant in affecting welfare changes.
Poverty and nutrition dynamics	Consumption and indices of adult body mass	Large seasonal variations in consumption and body mass index. One third to half of households moved out of poverty. Households do not smooth consumption much, but boost nutrition in favourable times.
Mobility across income deciles and relative poverty classes; impact of public transfers on poverty dynamics	Income, consumption	Growing inequality over time coupled with declining real income. Poverty persistence affects children more than the elderly. Cash benefits protected many, but promoted few out of poverty.
Methodological issues in targeting the chronically poor, economic and social intra- and inter-generational mobility, extent of mobility across deciles and poverty classes, estimate and characteristics of chronically poor, distributional dynamics	Income, consumption, food consumption, food share in household budget, access to land, occupation	Current consumption is not always a better indicator of chronic poverty than current income, but both perform much better than other common indicators such as food share and access to land. Agricultural labourers are at severe risk of poverty and their mobility out of agricultural labour is low. Despite greater upward relative mobility amongst poorer deciles, few escaped absolute poverty. The chronically poor are not necessarily the poorest. Land distribution and irrigation adoption affected income distribution, whereas Green Revolution technical change did not.
Impact of macro-shocks on welfare	Expenditure, employment, earnings, education, health care	Health and education investments in children have been hit, particularly amongst the poorest households.
Determinants of inequality and mobility across poverty classes, targeting chronically and transitorily poor using household characteristics	Income and expenditure	Non-farm income accounts for one third to one half (poorest quintile) of total income and, with livestock income, decreases overall inequality. Majority of poverty is transitory.

(cont'd)

Summary of research on poverty dynamics and main findings (cont'd)

Country	Dataset(s)	Sample size	Time span of panel(s)	No. of waves in panel(s)
Peru ^{10/}	Peru LSMS - World Bank and Cuánto	676 households	1991-1996	3
Philippines ^{11/}	Rural Philippines - collected by IFPRI et al.	448 households	1984-92	5 ^{d/}
Russia ^{12/}	Russia Longitudinal Monitoring Survey I - University of North California	6 300 dwellings	1992-94	4
Rwanda ^{13/}	Rural Rwanda - Government of Rwanda	270 households	1982-83	4
South Africa ^{14/}	Kwazulu-Natal Income Dynamics Survey - University of Cape Town, Natal, Wisconsin, and IFPRI	1 400 households	1993-98	2
Zimbabwe ^{15/}	Rural Zimbabwe - Kinsey	385 households	1982-3 to 1997-8	10

Source: adapted from Yaqub 2000.

Notes

- 1/ Reardon and Taylor 1996.
 2/ Scott 1999; Scott and Litchfield 1994.
 3/ Weil and Ravallion 1998, 1999.
 4/ Grootaert and Kanbur 1995; Grootaert et al. 1997.
 5/ Dercon and Krishnan 1999.
 6/ Galasi 1998; Ravallion et al. 1995.
 7/ Chaudhuri and Ravallion 1994; Dreze et al. 1992; Gaiha 1988, Gaiha 1989; Lanjouw and Stern 1991; Lanjouw and Stern 1993.
 8/ Frankenberg et al. 1999.
 9/ Adams and He 1995; Baulch and McCulloch 1998; 1999.
 10/ Cumpa and Webb 1999.
 11/ Bouis et al. 1998.
 12/ Mroz and Popkin 1995.
 13/ Muller 1997.
 14/ Mauricio et al. 1999a.
 15/ Gunning et al. 1999.
- a/ Hungarian Household Panel Survey: collected by Tarki; Hungarian Household Budget Survey: collected by the Central Statistical Office. Source: Yaqub 2000.
 b/ Rural Maharashtra and Andhra Pradesh, India: collected by CRISAT; Palampur village in Uttar Pradesh: collected by the authors; Rural India: collected by the National Council of Applied Economic Research.
 c/ Third wave covered only 25% sub-sample.
 d/ Four of the five waves were in 1984-5.

Form(s) of study	Welfare indicator(s)	Main findings
Mobility across poverty classes	Expenditure	More households were upwardly mobile than downwardly mobile.
Intra-household resource allocations and contributions	Income, food intakes, education and health	Adolescents make major contributions to family welfare.
Poverty and occupational mobility	Income	Over half the dwellings moved out of income poverty and only one quarter of the very poor remained very poor.
Methodology, estimates and determinants of transient and chronic seasonal poverty	Consumption	Worst poverty crises are after dry season. Transient seasonal poverty important for households around the poverty line, but of little importance to the poorest of the chronically poor.
Social dynamics and poverty	Expenditure	Education and social capital yielded substantial household returns in 1998 due to a more efficient economy. The effect of social capital is significant, but smaller than that of education.
Income dynamics	Income	Households resettled on white farms have increased returns to their accumulated assets. Income increases are greatest amongst those with the lowest incomes at the beginning of the survey.

Table 2.5: Aid to agriculture, forestry, fisheries (percentage of sectorally allocable aid)

	1987-9	1990-2	1993-5	1996-8
Multilateral	24.0	15.9	15.2*	n.a.
DAC Countries	16.1	13.7	11.6	11.9
EU Members, Total	15.4	12.5	12.3	11.0
ALL Donors, Total	20.2	15.3	12.1	12.5

*1993 and 1995 average; multilaterals not available separately for 1994 and 1996-8.

Source: OECD/DAC (2000).

Table 2.6: Agriculture/forestry/fisheries: percentage of total technical cooperation

	1993	1994	1995	1996	1997	1998
North Africa						
DAC Countries	22.8	17.8	13.7	13.2	12.2	12.0
EU Members	26.3	17.9	9.4	10.7	9.6	16.4
Sub-Saharan Africa						
DAC Countries	21.7	18.5	16.6	16.2	15.5	12.2
EU Members	21.7	12.3	14.7	14.9	13.8	11.5
Americas						
DAC Countries	18.9	24.5	17.5	15.3	15.7	12.1
EU Members	18.6	19.8	14.5	12.1	12.1	15.5
Asia						
DAC Countries	13.0	14.3	11.9	11.2	12.1	9.2
EU Members	11.8	13.3	12.2	9.8	11.6	9.2
Middle East						
DAC Countries	7.8	4.7	6.9	3.8	6.7	6.1
EU Members	4.9	1.7	5.0	1.4	5.5	4.6
Total Technical cooperation as % of aid to developing and transition countries						
	1993	1994	1995	1996	1997	1998
EU members	22.2	21.8	25.0	24.8	25.6	24.1
DAC countries	23.2	21.9	24.7	25.5	26.7	25.1

Source: OECD/DAC (2000).

Endnotes

- 1 Commonly used for international comparisons, this poverty line adjusts for differences across countries and times in PPP. At this line, a person obtains a 'global consumption bundle' worth USD 1 per person per day in constant purchasing power of 1993.
- 2 World Bank 2000b.
- 3 Ravallion 2000.
- 4 Harris and Todaro 1970.
- 5 Stark 1991.
- 6 Epstein 1973.
- 7 Connell *et al.* 1976.
- 8 Birdsall *et al.* 1995; Clarke 1995; Kanbur and Lustig 1999.
- 9 UN 1998: 31, 38.
- 10 Lipton 1977; 1982.
- 11 See note 1.
- 12 Shaffer 1999.
- 13 Glewwe and van der Gaag 1990.
- 14 Laderchi 1997.
- 15 Jodha 1988.
- 16 Sinha and Lipton 1999.
- 17 See Dercon 1998 for a discussion of cattle in Western Tanzania.
- 18 However, the poor in each grouping (a) are heterogeneous and (b) frequently draw livelihoods from several sources, especially where farmwork is highly seasonal or uncertain.
- 19 There are exceptions even here. In Guatemala, nearly three quarters of the poor live in rural areas, and in Nicaragua over two thirds (World Bank 1995b, 1995c).
- 20 Rao *et al.* 1988.
- 21 Nelson *et al.* 1997.
- 22 FAO Food Balance Sheets; Lipton 1983b.
- 23 FAOSTAT 2000; FAO Food Balance Sheets; Barrett 1994; Greeley 1987.
- 24 World Bank 1995c.
- 25 de Haan and Lipton 1999.
- 26 Sahn *et al.* 1999.
- 27 But not usually in sub-Saharan Africa, South India or Latin America: Harriss 1986; Lipton 1983a; Svedberg 1989.
- 28 On Asia see Lipton and Osmani 1997.
- 29 Sen 1981; Mitra 1978.
- 30 World Bank 2000e.
- 31 Vosti *et al.* 1991.
- 32 Tiffen *et al.* 1994.
- 33 World Bank 1993.
- 34 Lipton 1999.
- 35 Arunachal Pradesh, Nagaland and Uttar Pradesh have fewer than 900 women per 1000 men. By contrast, in China there is a bias against girls in allocation of health goods in a poorer province (Sichuan) but not in a richer province (Jiangsu) (Ahuja *et al.* 1997).
- 36 The differences (also the lowness of female participation rates in rural areas of some Muslim countries) are exaggerated by inaccurate reporting but are real, although less than official data suggest.
- 37 Rosenzweig and Schultz 1982.
- 38 Dev *et al.* 1991.
- 39 Lipton 1983a; Visarta 1980.
- 40 Krongkaew *et al.* 1994; Prescott and Pradhan 1997.
- 41 World Bank 1995d; Firdausy 1994; Balsacan 1994.
- 42 Wodon 1999.
- 43 World Bank 1995b.
- 44 Dev *et al.* 1991.
- 45 World Bank 1989.
- 46 Lipton 1983a.
- 47 World Bank 1999c.
- 48 Udry 1996.
- 49 Salto *et al.* 1994.
- 50 Qutsumbing 1994.
- 51 This is clear for small farmers largely subsisting on their own food production, but less so for the rural poorest. These increasingly rely mainly on wage income, which normally lags behind price rises during inflation (Mellor and Desai 1985).
- 52 Sinha and Lipton 1999.
- 53 To avoid a hail of statistics, we give only fragmentary evidence for many points in this section. References (and much more evidence) are in Livi-Bacci and de Santis 1999 and Lipton 1983.
- 54 Allison *et al.* 1989.
- 55 These associations, which also apply in many countries alleged to be exceptions (e.g. in West Africa), show that the poverty/household-size link is not much offset by 'economies of scale in consumption' in big households. Such economies could hardly apply to the dollar-poor, over 70% of whose consumption is normally on food, where scale economies are infeasible (Livi-Bacci and de Santis 1999: 34-41).
- 56 Bloom and Williamson 1997.
- 57 The median developing country in 1980 had dollar poverty incidence of 18.9%; the sample median fall in fertility through the 1980s of four per 1000, if achieved in 1980 and sustained, would have cut this to 13.9% by 1990, with growth and distribution effects about equally responsible (Lipton and Eastwood 1999).

- 58 In countries with 'fair' data, 'moderate to large' falls in total fertility rates (TFR) of 1.5-2 or more happened since 1980 in Kenya, Rwanda, Zimbabwe, Botswana, South Africa, Côte d'Ivoire and Senegal, with 'smaller' falls of 0.5-1.5 in Malawi, Tanzania, Zambia, Cameroon, Burkina Faso, Ghana and Benin (Cohen 1998: 1431-5). Demographic and Health Survey (DHS) data, usually good, imply 'smaller' but clear falls in Northern Sudan (Cleland *et al.* 1994), and for women aged 15-34 in Namibia, Niger, Madagascar and Uganda (Kirk and Pillett 1998: 5). On weaker data, Ethiopia and Swaziland also show moderate to large falls and Eritrea, Lesotho, The Gambia and Mauritania smaller falls. Mali seems the only African country with 'fair' data with no perceptible TFR fall.
- 59 Rural disadvantage can also be addressed through heavy urbanization by persons of working age who can remit or bring home resources to their rural families. This is consistent with big, growing urban-rural gaps in the dependency ratio (Table 2.3). But, to the extent that it is happening, it is not permitting rural people to achieve parity with their urban neighbours in income, security from poverty, or access to health or education.
- 60 Gregson *et al.* 1994.
- 61 FAO/UNAIDS 2000.
- 62 Basu 1999.
- 63 Connell *et al.* 1976.
- 64 Gregson 1994.
- 65 Walker and Ryan 1990.
- 66 Adams and He 1995.
- 67 Ravallion and Jaisan 1996.
- 68 Gaiha 1989.
- 69 A household is deemed to be chronically poor if its mean income is below the poverty line, while a household is transitorily poor if its mean income is above the poverty line but its annual income falls below the poverty line at least once during the period of analysis. The chronically poor may also be defined as those who have been poor for more than a certain number of periods and the transitorily poor as those who have been poor for fewer periods. Gaiha and Deolalikar (1993) apply the latter definition in their analysis of the Indian data.
- 70 Panel data involve the same households in each survey, tracking numbers and characteristics of people who move in and out (or further in and out) of poverty. Non-panel time-series involve random samples of households and track true trends in poverty incidence and characteristics. The two are not substitutes.
- 71 At the moment it is not possible to generalize the evidence in the poverty dynamics literature because studies vary too widely in terms of interests, methods and data. The range of interests across studies includes: relative versus absolute mobility; transient versus chronic poverty; changes in welfare levels associated with socio-economic characteristics of households versus changes associated with socio-economic 'shocks'; poverty dynamics over seasons versus dynamics over longer-run time frames; and targeting and other public policy issues.
- 72 Yaqub 2000.
- 73 See for example Walker and Ryan 1990; Reardon and Taylor 1996; Dercon and Krishnan 1999.
- 74 No time-series for urban and rural literacy separately are available anywhere in sub-Saharan Africa. See UNESCO Statistical Yearbooks 1965, 1970, 1980, 1990, 1994, 1998.
- 75 Sastry 1997.
- 76 The subsequent regional and country analyses draw upon the results presented in Annex Table 2.1.
- 77 Deininger and Squire 1998.
- 78 Milanovic 1998.
- 79 Aid is overseas development assistance to developing and transitional countries, either in grant form or as loans with an over 25% grant element. Net aid is gross aid minus capital repayments of past loan aid. Disbursements are aid paid by donors (as against 'commitments').
- 80 Randel *et al.* 2000.
- 81 Excluding South-East Asia but including China.
- 82 UNDP (2000): 218-222; World Bank 2000a: Ch. 11.
- 83 The 47 countries contained 4.2 billion people, of whom 1 billion consumed less than PPP USD 1-a-day.
- 84 Burnside and Dollar 1998.
- 85 White 1996.
- 86 Alesina and Dollar 1998.
- 87 UNDP 2000: 224-5, 170; World Bank 2000a: Table 1.1.
- 88 FAO State of Food and Agriculture 2000: 226.
- 89 Beynon 1999.
- 90 Datt and Ravallion 1996.
- 91 Beynon 1999.
- 92 Collier and Dollar 1999.
- 93 Beynon 1999.
- 94 Collier and Dollar 1999.
- 95 Dollar and Pritchett 1998.

CHAPTER 3

ASSETS AND THE RURAL POOR

The key to sustainable rural development is legally-secure entitlement to assets – land, water, credit, information and technology – on the part of the poor. Without secure property rights, farmers lack the incentive to invest in land management.

ASSET POVERTY: SCOPE FOR RURAL POVERTY REDUCTION THROUGH POLICY CHANGES

This chapter deals with various strategies to improve the asset holdings of the rural poor. In most cases, if the poor get a bigger share of asset control or benefits, efficiency and economic growth also improve. For many types of asset, reducing inequality between rural and urban areas slows down out-migration to the cities, and increases rural farm and non-farm income-earning opportunities.¹

Well-targeted policies can reduce poverty by increasing the opportunities for poor people to gain and maintain secure access to productive assets, especially land, water and other natural resources, together with social assets such as extension services, education and basic health care. The nature of their tenure over productive assets and related factor markets has a direct bearing on the extent of lasting benefit and opportunity for the rural poor to improve their livelihoods.

Assets take various forms and can be owned in various ways. Since this diversity has implications for the way assets are acquired and used sustainably, it is important to define the various meanings of 'asset' in the context of the rural poor (Box 3.1).

Lack of assets is an effect as well as a cause of poverty in terms of income opportunities, consumption and capability-building of people and their own institutions.

The term 'asset poverty' indicates a vicious circle.² People without assets tend to be consumption-poor because they rely mainly on selling their labour in poorly paid markets or to the landed class, have nothing to sell or mortgage in hard times, and are economically dependent and politically weak. Apart from the link between lack of assets and consumption poverty, asset disparities are huge.

Rural rich-poor total asset disparity. In rural India in 1971-72, the average household in the top decile owned 294 times as many natural, physical and net financial assets as those in the bottom decile.³ The average *person* in the top rural decile owned almost 400 times as much assets as a person in the poorest: over eight times the disparity in income.⁴

Rich-poor specific disparities. In the median country of 41 developing countries with appropriate surveys, below half the children aged 6-11 from the poorest fifth of households were in school, as against over 90% in the richest fifth.⁵ In Ghana, in the richest quintile, two households

in three have electricity, as against one in six in the poorest quintile.

Urban-rural asset disparities. The ratio of rural to urban illiteracy among persons over 15 in the early 1970s ranged from 1.4 to 2 in North Africa and Asia, and 2 to 3.5 in Latin America. In the following 10-20 years the disparity increased in all 24 cases (male, female and total, for eight countries with data) in Asia; in 15 of the 16 cases in Latin America; and in ten of the 15 cases in Africa.⁶

Complementarity and sequencing in assets reform are crucial to maximize benefits to the poor. For instance, their nutrition is usually advanced more cost-effectively by combining efforts on nutrition, health, water and education than by concentrating on only one asset.

Efficiency is improved by the participation of beneficiaries, including poor ones, in the 'project cycles' where specific activities focus on building up their asset base. The inclusion of women in civil society, encouraging their training in health issues, and participation in education and financial decisions can only improve efficiency. However, the goal must be to progress from participation to empowerment, so that the rural poor become effective interlocutors with their governments and local authorities in decision-making that affects their resource entitlements and livelihoods.

Improving the assets of the rural poor has multiplier effects on the rate of economic growth.⁷ The rural poor have frequently been excluded from access to land and other resources owing to the

Box 3.1: Assets: definition; ownership, control and benefit; gain and loss; and outcomes for the rural and the poor

Definition: An asset (also called 'capital', 'stock', or 'endowment') is anything that can be used, without being used up, to increase regular returns above receipts from labour, whether hired or self-employed, and thus enhance producers' income or consumers' welfare. Typical assets are land, wells, cattle, tools, houses, shares, skills, health and roads.

Access, ownership, benefit: Assets can be owned individually, by a group (such as the common grazing land of a village), by the state, or on an open-access basis where there are institutional understandings governing use but no one institution has control over access. People can control assets (by rent, hire, or influence in family, village or polity) without ownership, and can benefit even from assets controlled by others (when using a road, or earning at a sugar-mill).

Gain, loss: People gain assets by diverting income from buying food to saving for a plough; diverting effort, for example, from growing rice to digging wells or attending school; theft or fraud; or luck – often inheritance, or an appreciation in the value of what one already owns. One loses assets by physical depreciation (through non-maintenance of assets), environmental depletion or pollution; obsolescence; theft or fraud; or sale or mortgage.

The poor's assets: (a) The poor are hard pressed to gain assets. Much income and work are committed to basic consumer needs (and social obligations). Inheritances are small and rare. (b) The poor readily lose assets. In hard times they must often sell or mortgage them, to avoid even deeper transient poverty. (c) Indeed, if the poor do save, their vulnerability often leads them to put their savings into assets that, though low-yielding, are readily sold in crisis; or into other safe but low-yielding production assets; or even into zero-yielding stocks of food grains against a shortage.

Rural people's assets: Rural people have more 'rural-specific' assets (farmland, livestock, irrigation) per person than urban people, but fewer human, infrastructural or total land assets, and fewer assets overall. Often the consumption-poorest urban quintile is healthier and better educated than the middle rural quintile. Further, the agriculture-based rural poor are especially vulnerable to climatic stress and hence make forced sales of land or animals; they concentrate where land and water are environmentally vulnerable.

Upshot for the rural poor: Characteristics of the rural poor include low levels of assets, especially land, labour and human assets such as health, education and nutrition. Though countries differ greatly, urban-rural disparities in asset and consumption ownership and poverty globally have not shrunk since the 1970s. For the rural poor, consumption poverty and asset poverty help to cause and perpetuate each other.

Sources: Haddad et al. 2000; World Bank 2000a; Eastwood and Lipton 2000.

power of vested elites and poor rural services, including education, extension services, health care, or institutions and departments that do not engage with local people in decisions on resource allocations. Opportunities for rural economic development are, in many places, complicated further by historic urban biases in the allocation of public services.

Policy can improve the poverty impact of assets by increasing the extent to which such assets:

- use family labour and generate additional labour requirements in asset-building, maintenance and use (production);
- link to on-the-job training that upgrades the skills of smallholder farmers and agricultural workers;
- provide safe, healthy and non-degrading work;
- provide equal access to work and promotion for women and minorities;
- lower or reduce risk and seasonal variation, especially of employment;
- lessen exposure to sudden physical disuse, obsolescence, environmental or market non-sustainability;
- produce items that loom largest in the consumption of the poor and make them available on a reliable and affordable basis;
- produce goods or services in price-elastic demand; and
- experience rapidly growing demand for their products.

The key to sustainable rural development is legally secure access to assets by the land poor. When property rights are lacking or insecure, farmers cannot be sure they will benefit from their efforts and therefore lack the incentive to invest in sustainable practices of land management. The resulting land degradation and soil loss threaten the livelihoods of millions of people as well as future food security, with implications also for water resources and the conservation of biodiversity. This vicious circle linking poverty to the degradation of natural resources can be broken,

however, by ensuring that the rural poor gain secure access to land, water, credit, information and technology.

It is not easy to correct asset inequalities. Asset redistribution can disrupt the economy: deterring saving, inducing capital flight and impeding growth, especially in increasingly open world markets. But while this might sometimes be a risk, the risk of neglecting the rural poor can be even greater: rural conflict, environmental deterioration and expanding mega-cities. The methods of redistribution must take into account the transition costs from land-ownership patterns of high concentration by the few to smallholdings that may improve the livelihoods of the many. It is in this context that the evidence on the higher productivity of smaller farms shows that redistribution can often improve aggregate production while also redressing the problems of inequitable access.

Experience suggests that pro-poor asset policy should concentrate on three main types of asset.

First, land redistribution is a powerful weapon against poverty, essential for fast progress in very unequal rural areas with limited options. Small, fairly equal farms are good for employment, efficiency and growth. Yet land – often the main rural asset – is often locked into unequal, and socially and economically inefficient, farms. Although land reform has achieved much, in its conventional, centralized and imposed form it has run into problems resulting in concentration once again in the hands of the more powerful. But new methods of land reform have shown promising results. The nature of the approach must be location-specific since important opportunities exist in different contexts, amongst others, for civil society-based reform, resettlement schemes, restitution, negotiated or market-assisted land reform, land leasing and sharecropping.

Second, policies should raise poor people's control over water-yielding assets so they can improve

their returns from land, meet family needs for drinking water, reduce female drudgery and reduce the incidence of debilitating water-borne diseases. Such policies are urgent given the economic and climatic pressure to cut overall rural water use. Water reform involves techniques, participatory institutions, asset types and better water pricing.

Third, redistribution of chances to improve key human assets – including health, education, information and communication skills – should favour rural people, with particular attention to the poorest, women and girls, indigenous people and excluded minorities.

FARMLAND ASSETS AND THE RURAL POOR

Owner-occupied farming is one source of livelihood for rural people, especially the poor. Hired agricultural labour and non-farm activity are increasingly important. Yet policy helps the rural poor mainly by raising their income from farming. In this respect, the redistribution of rights in land to poor individuals has achieved much more than is commonly realized. It is economically sound, since in poor regions smaller, labour-intensive farms normally favour efficiency and growth.

Sustainable development is about improving the livelihood opportunities for the poor. For the rural poor, secure access to land is not just about farming; it is about asset formation. Land is a convertible asset that can be used to leverage credit or sold to finance the start-up costs of other income-earning businesses. Opening these wider opportunities provides families with the security that currently eludes the landless.

Hired farmwork and non-farm activity are significant and growing sources of rural income. But their growth usually depends on rapid, widely shared growth of incomes in local farming.⁸ Also, some 70% of rural household income in Asia comes from farming and farm labour, and about 60% in Africa and Latin America. Even by 2010, at

least two thirds of rural people – and 47% of all people – in developing countries will depend on agriculture.⁹ In the poorest regions, the rural dollar-poor are more dependent on agriculture in Africa than are other rural groups, though the evidence in Asia is mixed.¹⁰ The poor's other main source of rural income – non-farm activity – depends largely on local spending by the farming poor.

This enquiry into farmland assets produces seven conclusions.

1. Control of farmland is crucial for overcoming rural poverty, which, if it remains widespread in middle-income areas, is closely linked to extreme land inequality. In low-income areas rural labour income alone seldom suffices to avoid poverty, so most landless or near-landless rural people stay poor. Even the landless fare better where land is more equally distributed among small family farms. Small farms employ more people per hectare than large farms and generate income more likely to be spent locally on employment-intensive rural non-farm products, thereby stimulating overall economic development in the rural sector.
2. Land redistribution has been substantial and successful in many areas; the process is continuing and is usually equitable and efficient: small farms remain usually at least as productive as large farms.
3. To sustain their escape from poverty, post-reform farmers need appropriate infrastructures and services – more so if they are to compete as technology, information and farm-to-market systems adapt to urbanization and globalization.
4. Economic liberalization is gradually removing incentives and reforming macroeconomic policies that have favoured large-holder agriculture and the interests of the landed classes. In many cases, these changes make large-scale agriculture less profitable, and therefore indicate that more land may come onto local markets. This can potentially benefit the rural poor if the

valuation, financial and legal/judiciary systems are appropriate.

- Previous land reform programmes have often been unduly confiscatory, statist or top-down. 'New wave' land reform, which is decentralized, market-friendly and involves civil society action or consensus is sometimes feasible and consistent with just and durable property rights.
6. Land reform processes need to be inclusive of both the intended beneficiaries and other parties with legitimate interests. Collective or state farming is seldom chosen voluntarily, seldom works well, and in some cases has worsened poverty. Both communal land tenure and private tenancy can be pro-poor, restricting them is counter-productive.
 7. In supporting the processes to help the poor gain and maintain their access to land and other assets, reform agencies need to press for women to have equal entitlements and inheritance with their male counterparts. Women's control of land helps efficiency, equity, child health and poverty reduction.

Control of the farmland asset is crucial for reducing rural poverty

Poverty incidence usually rises as the amount of land owned or operated by poor rural households declines. The land the poor do control is usually of low quality, with less water control, and less secure rights, so villages with higher land inequality, other things being equal, have more poverty.¹¹

The poor's gains from land distribution have several sources

- If the poor operate land, they can combine it with labour, skills management and purchased inputs, eating or selling the product and reaping a higher share of net income, even if output does not change.
- Furthermore, output often rises: yield and total factor productivity tend to be greater on smaller and more equal operated farms.¹²
- Low-income people with secure land access usually find it easier to graze animals.
- Land in smallholdings tends to be managed more labour-intensively, raising demand for labour and increasing the wages and/or employment of low-income workers, even if they do not control any land.
- All these forms of control of land and hence income, if more equal, raise local spending on rural non-farm products, and hence employment in it.¹³

Tenancy arrangements such as leaseholds can reduce poverty by transferring farm-management responsibilities, and thus income, from owners to tenants.¹⁴ However, inequalities in land ownership, operation, access, management and control usually go hand in-hand. Where ownership holdings are highly unequal, great land inequality usually persists even for operated farmland, that is, after tenancies are allowed for, the management of larger operated holdings usually provides fewer jobs per hectare.

With such extreme inequality, widespread poverty can persist despite quite high average rural income. Rich landed classes pass on to succeeding generations not only land and power but lasting protection against progress and mobility by the land-poor. This 'frozen history' stems from inheritance, across many generations, of land enclosed by colonial or national elites. The disadvantaged groups often ethnic minorities, become landless and are forced by coercion or hunger to work for the elites, or escape (or are pushed) into areas that the elites do not covet: ill-watered, hilly, remote, or otherwise marginal lands.¹⁵

This process, and concentration of inherited rural disadvantage, make it hard to relieve rural poverty. Where this has produced extreme land inequality with few options for the rural poor – in Kenya, South Africa, Zimbabwe, North-East Brazil, Bihar in India, parts of the Philippines – land distribution must be addressed for rural poverty to fall rapidly.

Table 3.1: Poverty profile by landholding class, rural Bangladesh, 1988-89

Landholding class (acres of owned land)	Per cent of population	Head count index of poverty (%)
Landless (0-0.04)	13.9	61.4
Near landless (0.05-0.49)	31.5	53.9
Marginal (0.50-1.49)	19.2	43.4
Small (1.50-2.49)	11.3	34.2
Medium (2.5-7.49)	18.8	26.6
Large (7.50+)	5.3	10.1
Rural Bangladesh	100.0	47.5

Source: Bangladesh Bureau of Statistics in Ravallion and Sen 1994.

IFAD's regional poverty assessments confirm that in most of the developing world lack of access to land is associated with low incomes and rural poverty. Landlessness and poverty risk go together also in Ethiopia, Chile, China, Côte d'Ivoire, Kenya, India, the Philippines, Tanzania and Zimbabwe. In El Salvador, a 10% rise in land ownership boosts income per person by 4%. Even tiny holdings of decent, adequately watered land reduce poverty: in rural Bangladesh, a rural household with below 0.2 ha of land consumed 7% more per person and, with over 1 ha, 43% more than a landless household.¹⁶ Thus even among those controlling land, poverty is correlated with the amount of land a household controls (see Table 3.1 for Bangladesh). Rural poor landowners suffer from high inequality in distribution of land in much of the developing world. Box 3.2 shows evidence of landholding inequality in selected countries.

Greater farmland equality helps to reduce poverty in the larger economy also; even as agriculture's share of output falls in developing countries, 'agrarian structure does not wither away' as an explanation of national inequality and therefore poverty.¹⁷ Moreover, land equality is associated with faster overall growth.¹⁸ It is also complementary to market-oriented growth in reducing poverty: for example, when liberalization reduces farm price repression, lower-income people are much more likely to benefit if they have enough land to be net sellers of food, not net buyers.

Land distribution also alleviates the poor's vulnerability. In an emergency, the landless have no land to sell or mortgage. Their infant mortality is much higher than among the landed.¹⁹ Landless labourers are much more likely than farmers to die in famines.²⁰ During harvest shortfalls, farm families do more of their own work and eat more of their own product, so that they hire fewer, or no, harvest labourers.

Land reform has demonstrably reduced poverty. This was notable in Taiwan. In India the States with faster falls in poverty in 1958-92 are those that have implemented more land reform, other things being roughly equal. Beneficiaries of land resettlement in Zimbabwe saw their real incomes quadruple in 15 years. Quite modest land reform in Kerala, India, produced sharp poverty reduction (despite sluggish output) due, in part, to the complementary public investments in education and healthcare plus overseas family remittances.²¹ Most strikingly, the shift of Chinese farmland in 1977-85 from larger-scale brigade management to a highly egalitarian household responsibility system accompanied unprecedented and sustained growth in staples and other farm output; in this brief period more than one in 20 of the world's rural population moved out of food poverty.

Thus, with appropriate policy, land redistribution tends to raise both employment and income. It can be community-driven and may take various forms tailored to local conditions. It can also build

Box 3.2: Inequality of land distribution in selected countries

Guatemala: In 1979, 2.5% of farms (with an average farm size of 200 ha) controlled 65% of agricultural land, while 16% of the land was cultivated by 88% of farms (average farm size 1.5 ha).

Bolivia: In 1989, landholdings larger than 2 500 ha (0.6% of all landholdings) occupied 66.4% of the land, while landholdings smaller than 3 ha (52.5% of all landholdings) occupied only 0.8% of the land.

Chile: In the early 1990s, commercial farmers cultivated 61% of the farm area, while the poorest farmers (*minifundistas*), who were three times more numerous, cultivated only 2% of farm area.

India: In 1961-2, 60.6% of rural households were marginal farmers (farming an area less than 2.5 acres) who owned 7.3% of the land, while large farmers (owning more than 25 acres), who represented 3.1% of households, owned 30.3% of the land. By 1991-2, these disparities had eased, with marginal farmers and large farmers controlling roughly equal areas of land (around 15% each).

Pakistan: In 1960 landholdings of less than five acres were held by 19% of farms and covered 3% of farm area, while landholdings greater than 150 acres (representing 0.5% of farms) controlled 11.5% of farm area. By 1991, 47.5% of farms controlled less than five acres and covered 11.3% of farm area, but 0.3% of farms with more than 150 acres of land controlled 10.1% of farm area.

Sources in country order: World Bank 1995a; World Bank 1996c; World Bank 1995k; NSS data in Pal and Mondal 1994, Sarvekshana 1997; Mahmood 1993.

on existing communal or tenancy systems as long as these systems do not present equitable opportunities by all sub-groups including men and women. Even so, some cautions are needed.

- (a) Land distribution shifts many resources to poorer people only where land inequality is initially large per person. In a Punjabi case, land inequality per person was only half as much per person as per household.
- (b) The national scope for redistribution is limited where large holdings are commonest in regions with inferior land. Such land is less valuable to recipients and cannot readily be assigned to the land-poor far away. However, the local scope for land redistribution is increased because farmers with more land tend to have better land and more access to major irrigation.
- (c) Occasionally those with little land are as prone to poverty as those with none, for example in Burkina Faso, Mali, Western Kenya and some other areas of Africa; this is most common where land quality is very poor or where the landless have more non-farm income.

- (d) Not only household access to land, but also women's access within the household, affect poverty.²²

The success of previous land reforms: the efficiency and equity case for persisting

Latin America

Latin America has the world's most unequal farmland, and hence much more poverty than would be predicted from income per person. Yet there has been massive land reform. The pace slowed after 1985, partly because so much had been done (Box 3.3); partly because severe land inequality persisted even after reform; and partly because some land reforms had imposed collectivism, with bad economic outcomes, retrieved by egalitarian privatizations only after a costly and disruptive detour.²³

South Asia

In the 1950s, India reallocated most northern intermediary *zamindari* (tax-farmed) colonial land to working middle farmers. But the second phase of land reform – redistribution of land rights and improvement in terms of tenancy, within a largely

Box 3.3: Experience of land reform in Latin America

In **Mexico** intermittent but at times truly revolutionary reforms in 1918-68 redistributed 64 million ha, yet left huge inequalities and masses of near-landless farm workers, largely indigenous 'Indians' whose alienation has precipitated violent disturbances in Chiapas since 1994.

In **Ecuador** in 1964, 83.9% of all agricultural land, about 809 000 ha, was distributed to about 15% of farm families: about 86 000, plus 48 000 settled on colonized land. There was no clear tendency towards large or reconcentrated units in the reform sector.

In **El Salvador** after 1980, about 80% of 100 000 intended households obtained direct access to lands expropriated from holdings above 100-250 ha.

In the **Dominican Republic** by 1961, 83 000 ha were distributed as 32 275 private parcels (13% of peasant holdings), plus 30 000 ha as collectives.

In **Peru** 8.6 million ha, 40-50% of agricultural and grazing land, were expropriated in 1969-80 to 375 000 direct beneficiaries, or 24% of the rural economically active population. The initial cooperatives and associative enterprises proved unstable and were later largely privatized.

In **Chile** the reform sector, by July 1972, comprised 35% of agricultural land (in quality-adjusted units, basic irrigated hectares). Over two thirds of these 900 000 basic irrigated hectares remained reformed (or public) in 1986 after Pinochet's major counter-reforms – though much land did revert to the original owners, or (as forests) to large and multinational enterprises.

Other Latin American countries had major reforms, but with exceptions **Colombia** illustrates aborted reform. In **Argentina** and **Brazil** most land is unreformed, but the reform process in Brazil, initiated in 1998 by President Cardoso, has distributed over 2 million ha of land with very encouraging lessons emerging from the Negotiated Land Reform programme under way in the north and north-east.

Sources in country order: King 1977: 93; Carter and Mesbah 1993: 291 and Zevallos 1989: 50-2; Strasma 1989: 409-12; Stanfield, 1989: 319-23; Carter and Mesbah 1993: 288-9; Thome 1989: 204 and Jarvis 1989: 245; de Janvry 1981.

intermediary-free system – was largely frustrated as large landholders used the law, political manoeuvring and corruption, and *mala fide* (bad-faith) land transfers to supposedly powerless poor relations and clients, to avoid loss of land under ceilings legislation. In India by 1990 'only' 2.9 million hectares had been declared surplus, 2.4 million possessed and 1.8 million distributed to 4.1 million persons. As with the further 0.9 million hectares distributed in 1952-54 in the *Bhoodan* movement, the land was mostly low-grade, and the scale of the distribution was modest, though some 12-18 million, mostly poor and often members of scheduled castes and tribes, gained from it. In Pakistan, evasion of land reform was even greater.²⁴

The South Asian experience, however, shows that even modest 'official' reforms can lead to considerable indirect land redistribution.

- Beneficiaries of *mala fide* sales and transfers began to insist on their rights.
- To escape ceilings, big farmers sold land to poor relations and clients.
- Even in remote villages of recalcitrant States, land ceilings changed the atmosphere: despite personal risks, a few very poor people insisted on making their claims and a few exceptional officials on enforcing them.
- Political activism prevented the avoidance of tenancy reforms for the poor through evictions in at least two Indian States, namely, Kerala and West Bengal. In some other States, such as Karnataka and Maharashtra, populist politics led to successive land reforms that benefited castes comprising mainly poor tenants.²⁵

India has redistributed less than 2% of total operated farmland. Yet the rise in the proportion of

land in smallholdings suggests indirect land gains for the poor, caused by sales to escape ceilings legislation. Operated area per marginal holding probably rose in 1961-81. India is among several countries where inheritance among growing farm families, alongside a threat of ceilings implementation, outweighed pressures towards larger farm size: both owned and operated holdings became less unequal. This pattern was confined to countries with land reforms, including several, such as Pakistan and Sri Lanka, where evasion was widespread.²⁶

Sub-Saharan Africa

For several reasons, many African countries have not attempted land redistribution. First, land is widely believed not to be scarce and hence not to require distribution. Second, some consider land redistribution as irrelevant to communal tenure systems. Third, it is often wrongly alleged that African small farms are less efficient than large ones (Box 3.4). Yet the future of conventional land reform lies, in part, in sub-Saharan Africa. Ethiopia transformed one of the world's most feudal land systems, through a terrible collectivist detour in the

Box 3.4: The efficiency of small farms: some evidence

Allowing for land quality, land productivity of smaller farms is usually at least twice that of the largest ones ... in Colombia ... in NE Brazil in most of the six zones; in India [and in the Muda Valley], Malaysia'. This is confirmed by farm-level data in 12 of 15 'countries [and] in a study of Indian villages, where a 20% decline in [gross output per hectare] was associated with a doubling of farm size'. Though this effect was not confirmed in Peru, it was strong in Mexico and Barbados, and confirmed for Brazil, through many studies. There is strong evidence in the same direction for the Philippines, Bangladesh, the Dominican Republic, Madagascar and Kenya. In Malawi, 'evidence ... on domestic resource costs [per unit of tobacco output] reveals that the smallholder sector holds the productivity edge' despite massive discrimination against it. For rice in West Africa, small farmers with traditional systems – not big mechanized farmers with subsidized irrigation – are competitive and efficient at world prices.

Output per hectare in north-east Brazil in 1973 was 5.6 times higher on farms of 10-50 ha than on farms above 100 ha; in the Pakistan Punjab, 2.7 times higher on farms of 5.1-10.1 ha than on farms above 20 ha in 1968-9; and among double-cropped farms in Muda, Malaysia, 1.5 times higher on farms of 0.7-1 ha than on farms of 5.7-11.3 ha in 1972-3. These comparisons understate the apparent output gains from shifting land from the very largest units into small ones. In Brazil in 1980, receipts per hectare of agricultural land in the smallest farm size (below 1 ha) were 100 times those in the largest (above 10 000 ha); per hectare of cropland, three times larger; per unit of capital, five times larger – and per unit of labour 20 times smaller. Some of these gaps may be due to land quality; mostly, they show how much small farmers' higher employment-intensity leads to higher land productivity.

Usually, small farmers' advantages are due less to higher yields of the same crop than to a higher-value crop-mix, more double cropping and intercropping, and less fallowing. All this carries environmental risks and benefits, which need careful review before land reform.

Poorer farmers also support local food security by concentrating their higher labour-per-hectare on raising yields in staples, and by putting more of their land into them. Aversion to purchase price risk stimulates staples production for net buyers (normally poorer), but aversion to sales price risk deters staples production for net sellers. This was confirmed in Mozambique.

Sources in order: Colombia, North-East Brazil, Muda: Berry 1984. Indian villages: FAO 1991. Peru, Mexico, Barbados: Cornia 1985. Mexico, Brazil: Thiesenhuessen 1989: 20. Brazil: Kutcher and Scandizzo 1981; Thiesenhuessen and Melmed-Sanjak 1990. Then in country/region order: Hayami *et al.* 1990; Boyce 1987; Stanfield 1989; Barrett 1994a; Hunt 1984: 254-62; Sahn and Arulpragasam 1990; and on West Africa, Pearson *et al.* 1981. On Brazil, Pakistan Punjab and Muda, Binswanger *et al.* 1995, analysing Berry and Cline 1979. On Brazil 1980, Thiesenhuessen and Melmed-Sanjak 1990; then in country order Barrett 1994a; Bharadwaj 1974; Boyce 1987, for Bangladesh. Finkelstein and Chalfant 1991, and Fatchamps 1992, on farm size and response to price risk; and Barrett 1994a, on Mozambique.

1970s, to something approaching, in many areas, not-too-unequal family farming. Over a million hectares in Kenya were distributed, much of them to the rural poor, in the 1960s, but Kenya (like Malawi, Zimbabwe and South Africa) remains an extreme case of post-colonial land inequality. In Zimbabwe, it is estimated that some 4 500 largely white commercial farmers own over 11 million hectares of mainly high-quality agricultural land, while over 1.2 million poor black households are confined to low-quality communal areas covering a little over 16 million hectares. Zimbabwe and South Africa have embarked on reform: the former with long delay (only 70 000 ha between independence and 1998) and much disruption; the latter very tentatively; both under growing pressures to transfer reform lands to the non-poor. African land reform will need to spread, but even within Southern and Eastern Africa, IFAD identifies three distinct situations (Box 3.5). Much land legislation is under way in sub-Saharan Africa, which in many areas is emphasizing the strengthening of rights and security in an attempt to accommodate the divide between statutory and traditional tenure regimes. Redistributive reform is occurring on a smaller scale, however.

In all these cases, it is hard to envisage affordable employment prospects for the rising poor workforce without smallholder-based agricultural

growth. Yet the rising workforce means that area expansion takes place into steadily more remote or low-quality land, even in most of West Africa. Especially if yield expansion continues to be disappointing, IFAD's conclusion that 'many smallholders do not have access to sufficient land to [anticipate] significant reductions in poverty through agricultural development' means that rural poverty reduction in much of Africa requires land redistribution to smaller and more equal holdings. Efficiency requires the same: even in an apparently favourable case, Malawi, growth based on large farms, that is, without land reform, is increasingly unviable as land scarcity and labour-surplus become the norm. In many other African countries, not only poverty reduction but also efficient rural growth require redistribution of emerging modern land-rights to the poor, away from absentee yeoman politicians and their clients.²⁷

Transitional Economies

Box 3.6 outlines experience of land reform in ex-Communist countries in the 1990s. There is a striking contrast with China in 1977-85, where egalitarian distribution of formerly state or collective land-rights induced massive poverty reduction alongside efficiency gains. Most of the former Soviet Union lost this opportunity, leaving land

Box 3.5: Land reform in Southern and Eastern Africa: three situations

'In ... Zimbabwe, Lesotho, Malawi, South Africa, and to some extent Namibia ... [very unequal] access to land under conditions of limited agricultural potential ... [is] the result of historical circumstances [rather than] population pressure ... it is difficult to see how smallholder agriculture can contribute to a significant reduction in rural poverty without revision of the distribution of land' – as in much of Kenya, Eastern Zambia and parts of Uganda.

In a second set of areas, 'particularly in montane zones (Rwanda, Burundi and Southwest Uganda) land availability is limited and smallholding is the dominant system of land use'; here, the scope for land redistribution may be less, but can be ascertained only by careful enquiry into the actual inequality of control over land (in quality-units per person).

In 'parts of Tanzania, Mozambique, Angola and Zambia, unused good land is relatively abundant and there are real prospects for area expansion by smallholder producers (particularly [with] mechanical or animal traction)'; but incentives – and institutions of land allocation – do not now favour small-farm or employment-intensive development of such areas.

Source: IFAD 1999f.

locked into inefficient modes of ownership; but some land reform has taken place.

Reform experience confirms the greater efficiency of small farms (Box 3.4). Redistributing farmland control to poor families (a) relieves poverty because their income from farming rises, and because they hire more labour per hectare from other poor families; (b) gives the poor property rights incentives to investment and management; and (c) increases yields (and often total factor productivity) by shifting land to people with lower transaction costs in screening, applying and supervising both family and hired labour.

Thus, well-conducted land redistribution can both favour efficiency and reduce rural poverty. Lieten²⁸ argues that land reform in West Bengal triggered faster growth and poverty reduction, from 52% in 1978 to 28% in 1988; improved efficiency of irrigation required prior equalization in the agrarian system. Besley and Burgess²⁹ show that Indian States with more land reform also later achieved faster poverty reduction. Tyler *et al.*³⁰ show that countries with more equal land

enjoyed faster agricultural growth. We have seen that economic growth tends to be sluggish in very unequal countries, probably mainly because excluding large proportions of people from access to land and human capital is inefficient.

Today, land reform has returned to national and international agendas, as seen in the international summits and agreements of the 1990s. Land reform is a central pillar of, amongst others, the UN Commission on Sustainable Development, the World Food Summit, the Convention to Combat Desertification and the Convention on Biological Diversity. Each of these events has been informed by the challenges and difficulties experienced in the past ranging from (a) redistributed land to the non-poor; (b) failure to identify, train or support beneficiaries committed to farming; (c) lack of mechanisms to resolve conflicts and address complex situations such as civil strife and land invasions; (d) confiscation without compensation; (e) top-down state-led reform; or (f) forced collectivization.

The 1980s saw progress in Iran, Nicaragua and El Salvador. In the 1990s reform moved on to the

Box 3.6: Land reform in ex-Communist countries

Countries like **Poland**, have little to reform. They avoided wholesale collectivization, preserving small-scale family farming throughout the Communist period, and still do so. But they face acutely the problems of keeping poverty falling after land reform, discussed below.

Some, like the former **Czechoslovakia** and **East Germany**, have undertaken 'restitution', not land reform. Former state and collective land is being restored to those, mostly large, farmers from whom it had been confiscated.

Other countries, such as the **Ukraine** and **Russia**, have allowed some collectives to privatize, but most farmland remains in state farms or top-down collectives. Yet there has been a big rise, from a tiny base, in the highly productive areas in auxiliary household plots; this has limited the impact of rural and urban poverty during the severe stresses of the 1990s. Even as privatization advances, it is doubtful whether vast, flat, combine-harvested wheatlands can return to small-scale farming. Elsewhere in Russian farming, land reform will remain a live issue, not only to reduce rural poverty and inequality, but because labour absorption is politically and socially urgent.

Viet Nam, notably, followed **China's** 1978-84 lead in land reform. Both have privatized, to fairly equal family farms, much ex-collective farmland. In **Romania** in 1991-2, about 80% of collectivized farmland was redistributed, largely as small, family-size farms. Reform in **Armenia** and **Albania** was also egalitarian, and drastic, and showed that family farmland assets can reduce suffering even during violent disruption. However, these situations reveal that the impact on poverty depends on ensuring adequate training in farming skills, access to related resources and capital and the degree of land fragmentation.

Source: Ukraine: Csaki and Lerman 1997; Russia: Brooks *et al.* 1996; China and Viet Nam: Kerkvliet 1998 and Albania: Kodderitzsch 1999, IFAD 2000.

agenda in Brazil, Colombia, Ethiopia, Honduras, South Africa and Zimbabwe. While the extent of reform varies from country to country, there was a shift – notably in Indonesia, Thailand, Tunisia, Morocco and Algeria – from redistribution of private lands to settlement schemes, market-assisted reforms and, in several transitional economies, smallholderization of state lands.³¹ The conclusion for Latin America has resonance for the world's poor: 'reports of land reform's death are . . . greatly exaggerated'.³²

Finding new paths to reform and fostering multi-stakeholder alliances is essential, since the experience of agriculture-sector reform has shown that civil-society movements lacking the necessary institutional and public support, and government-led reforms lacking the support of civil society, have both failed. What are needed are revitalized alliances between governments and civil-society organizations, coupled with the moral and financial persuasion of the international community.

Revitalizing support for land reform and improving the access by the rural poor to productive assets was stimulated within and between countries by the IFAD-sponsored 1995 Conference on Hunger and Poverty, which resulted in the for-

mation of the Popular Coalition to Eradicate Hunger and Poverty. This global consortium of intergovernmental, civil-society and bilateral organizations is working towards the empowerment of the rural poor by increasing their access to productive assets, especially land, water and common property resources, and by increasing their direct participation in decision-making processes at local, national, regional and international levels.

Many land reforms have achieved much. The critics are disappointed because they expected even more (Box 3.7).

Keeping poverty falling after land reform: services, inputs, markets

Complementary service provision must be within the cost capacity of small farmers' needs, or else cooperatively or publicly supported. The lack of access to inputs and services can deny land recipients the benefits from reform. In Nicaragua and the Philippines, restricted access to credit, together with poorly defined property rights, led land reform beneficiaries to sell their land. In the 1980s, under the West Behiera Settlement Project, IFAD helped the Egyptian Government to

Box 3.7: Four land reforms: high expectations, deep disappointment, medium achievement

In Ecuador, some claim that neither the 1964 nor the 1970 reform 'brought about a major redistribution of land'. Yet in 1964-83 9% of all agricultural land . . . had been adjudicated to . . . 15% of the country's farm families; in 1954-74 land in holdings above 1 000 ha fell from 37.4% to 22.1%.

In Peru's early reforms (1964-68) 384 254 ha were distributed to 14 345 peasants, yet these accounted for 'only 4% of the land that could have been distributed with the legal instruments available and less than 2% of the peasants in need of land'.

In El Salvador, some complain that 'a much-vaunted smallholders' reform has accomplished only half its goals . . . 40% or more of the rural population [the landless] are not statutorily included in the reform'. Yet 22.7% of rural families benefited – not bad, even 'as against a goal of 60%'.

In Iran, the lands in 16.5% of villages had been purchased and distributed to 710 000 families in Stage I of the reforms, and in a further 4% of villages to 7% of rural families in the second stage, by October 1972. In all three stages (1962-75), lands in 53% of villages were redistributed and 1.9 million families, 92% of those eligible, benefited. Yet critics stress that the landlords kept the best land; that most peasants received (as owners) small plots, 'probably less than the holdings they used to cultivate' as pre-reform tenants; and that though 'land reform [gave land] to a large majority of the eligible peasants . . . most of the remainder lost their rights and joined the landless'.

Sources in country order: Carter and Alvarez 1989: 23-43; Lastarria-Cornhiel 1989: 138; Diskin 1989: 429, 435, 443; Amid 1990: 93-9, 102-3.

rehabilitate the West Behiera State Farm's irrigation and drainage infrastructure and to then privatize it by distributing the land to smallholders. To ensure higher agricultural production and incomes, the project also provided adaptive research, extension and poverty-oriented credit services to small farmers. In the reclaimed desert areas of the West Delta, the Newlands Agricultural Services Project is providing post-settlement support services in technology generation and transfer, improved on-farm water management, access to institutional credit and marketing services in order to assist the landless settled on 2 ha plots to establish sustainable and profitable farming systems.

However, if governments wait until all input supply conditions are ideal, they will never enact land reform. Markets, not governments, supply most farm inputs and services to farmers, whatever their size. The problem arises when inputs and services are mainly geared to demand from the large and/or capital-intensive farm sector. Governments should avoid subsidizing such private services, but should create incentives to realign them to meet small-farm needs. Large farmers, with big surpluses, can overcome remoteness directly – marketing crops, or trucking in fertilizers in lorryloads – whereas smallholders need appropriate access, via competitive traders, to services, inputs and markets. Also, large farmers' information often allows them to rely on private research; whereas small farmers need public research, as well as competitive, logistically available inputs from the market.³³

Small farms face four threats to efficiency gains after they receive land assets, but these can usually be managed at costs far less than those of the huge efficiency dispersion (and poverty) associated with a very unequal land asset.

1. Wealthy farmers often gain most from public provision or subsidy for credit, services, infor-

mation, irrigation and farm research. Often a tiny proportion of these inputs reaches small farmers, especially remote-area and drylands farmers and women. While small farms are thus made artificially uncompetitive with big ones, their yields – and interest in farming – will disappoint. Removing price distortions that selectively harm small farms may induce rich farmers to sell land to poor farmers, and is anyway a desirable complement to land reform. In the case of some inputs, like pesticides and water, subsidies can also be environmentally harmful.

2. Some crops, such as rubber, sugar, some beverage crops, tobacco, soft fruits and vegetables need timely, coordinated collection and processing. This favours large farms unless institutions to service small ones are in place. But such services are often provided cooperatively by small farmers, or privately by processors, traders, or contract farmers.
3. The potential for large farmers to shift from their role in commercial production to a new role as the provider of services to smallholders can often be easily realized. As large holders they frequently engage in processing, marketing, finance and extension. In some cases there may be mutual benefits if they take on this new role. This is harder if land reform, even with fair compensation, is often conflictual. Also, there is a risk that the rural poor will remain dependent on the former landowner in their new role as sole provider of factor markets.

Such intermediation, by pre-reform large farmers turned service managers, is one way for small farmers and land reform beneficiaries, provided they do not face new monopolies of power and control or gain benefits from the knowledge of former landowners on how to function in a world of market integration and globalization. To benefit they must adapt, combine and bargain. Public policy would be needed to moderate potentially

exploitative practices that could easily become monopolistic unless governments stimulate expansion in the number of competitive service providers.

'New wave' community-based land reform

Many of the rural rich are experienced, hard-working farmers, not personally guilty of past land theft. How can they be fairly accommodated or compensated in situations where avoiding land reform will doom to failure efforts to overcome hunger? Experience suggests that new methods for negotiating land reform need to recognize both the legitimate needs of the landed class and the resource entitlements of the landless and near landless. Unless there is greater transparency in the negotiations between the poor and government officials on the methods of land transfer, the poor are likely to find themselves excluded. But community-based land reform puts the poor at the centre of the process.

The government must show sensitivity in handling the conflict of interest between landowners and the rural poor, those who now possess and those who stand to gain access to public land. The unique nature of each situation requires a specific local model tailored to each case. Such efforts include negotiated land reforms in Colombia and Brazil. Governments provide an appropriate legal framework, and some or all of: credit; some subsidy, perhaps as a land voucher, with an upper limit (in South Africa in 1995-99 some USD 2,000) to target help to the poor; smallholder-g geared support services; and tax or other incentives for land to move towards smallholders. Potential buyers organize themselves, identify land for purchase and draw up plans for its productive use.

Beneficiary selection may be based on self-selection or social criteria. Such schemes encourage potential buyers to seek out run-down or under-utilized farms as these are less costly to purchase. The need to develop careful farm-planning

models induces beneficiaries to consider how they will develop the land and identify problems, before resettlement. Thorough planning enables greater intensity of land use, reducing the amount of land area required. 'Farm plans also serve as a first step towards the identification and prioritization of investment needs, and to provide justification for guiding the allocation of public funds to the most productive use.'³⁴

Land reform today has new institutional requirements: group formation, land search and valuation, negotiation, bidding, farm planning, and training and service support for several planting seasons while beneficiaries learn the skills and develop the market linkages to become profitable smallholder farmers. Guidance is often required by outside organizations; it has often come in the past from an NGO or civil-society group which has supported the community during the period of acquiring the land. Conversely, the support has often come from multilateral or international financial institutions, such as IFAD, that support land management projects. An example is IFAD's Sustainable Development Project for Agrarian Reform Settlements in the Semi-Arid North-East in Brazil, which is to provide smallholder support services based on the concept of community-based land reform.

Land reform can be supply-led and push up the net supply of land from sub-dividing government-held public lands and large-scale farms for sale in small units to the landless or near landless. Or reform can be demand-led: pushing up net demand for land by land-poor households. Demand-led methods, with farmland increasingly scarce, induces large land-price rises for only small rises in the quantity of land supplied from rich to poor. Even announcing pure willing-seller/willing-buyer concepts, in a context of purely demand-led reform, can push land prices up. Such reform is expensive, raising problems about what the taxpayer is able and willing to afford. It is likely

to transfer land exclusively to the poor when land prices are relatively low, for example when the rich are facing mortgage foreclosure, natural disaster, collapsing product markets, or fear of land seizures or invasions.

Supply-led reform is more promising. The *Bhoodan*, or land-gift, movement in India in the 1950s appealed to rich people's sense of moral and religious duty, and released substantial areas of land, but mostly bad land, which did not always pass to the poor quickly, or at all. In Taiwan in the 1950s, the government could induce higher land supply by offering landlords compensation in the form of shares in seized Japanese urban assets. In much of Southern Africa, colonial laws against subdivision remain; scrapping them would raise land supply from rich to poor. Where there are well-recorded individual land rights, even quite modest rates of progressive land tax can both raise land supply and steer it towards small sales, helping poorer buyers. In north-east Brazil's decentralized reforms, local authorities secured consensus by offering large landowners access to new irrigation on their retained land, in return for giving up some land cheaply to the reform;³⁵ but this requires the taxpayer to pay (helped in this case by a World Bank loan).

Where the land needs of the rural poor are suppressed over long periods, as in many countries, conflicts will arise in various forms. Land invasions are regarded by some as illegal acts, whereas others argue that in the absence of any stable way to feed the families, which are the victims of intergenerational poverty, land invasions are understandably a last resort for desperate people. To fail to redress land inequality merely postpones civil conflict, like that in Central America from the 1970s to the 1990s. While land invasions (as in Zimbabwe in 2000) can involve violence, destroy farm assets and alienate big farmers, they should be seen as a symptom, not the cause, of the land problem.³⁶

Even with suitable incentives, very unequal farmland control – unlike the mode of that control through tenancy, sharecropping, communal lands, or otherwise – may persist even if it is inefficient, because it enhances the power or security of the rich. That makes a strong efficiency and equity case for reducing extreme inequality in farmland control. But, given the distribution of farmland control, there is no obvious case for restructuring tenurial and managerial forms; with correct incentives they reform themselves. Most attempts to replace land redistribution by imposing changes in tenurial and managerial forms, but without consensus, including the poor, or moves towards more equal rights in land, have been unsuccessful, often counter-productive, and sometimes disastrous (see Annex 3.1).

Women, land and poverty

Reducing the barriers to women's control of rural assets, especially land, is crucial for policy against poverty.

- The barriers against women's possession and control of land cause poverty through discrimination within households that do not pool income from assets, or do not distribute that income equally. 'The risk of poverty and the physical well-being of a woman and her children could [depend on whether] she has direct access to . . . land, and not just access mediated through . . . male family members, [especially] for female-headed households with no adult male support'³⁷
- Denying efficient managers access to assets because they are women is expensive. In Burkina Faso, household output could be increased by 10-20% by reallocating currently used agricultural inputs more evenly between men and women. The same household income, if it comes from women's asset holdings, improves child health, nutrition and education in Bangladesh, Ethiopia and South Africa; assets in the hands of women significantly raise the share of household

expenditures on education. Extra income, including asset income, accruing to women rather than men is in several countries linked to more outlay on, and gains in, child nutrition.³⁸

- Denying women assets is unjust.

Few traditional or reformed land allocation systems have significantly raised women's control over land, though most Latin American countries have revised their land reform title laws to obtain gender equity. Many societies have shifted education, health, non-farm assets and access to assets through credit towards women; but large shifts of farmland towards women are far rarer. Giving women rights to land also gives them power, helping them to take more control in existing relations, not least by improving women's reservation wage, and hence their role and bargaining strength within marriage. Such empowerment reduces their vulnerability within the household; in Bihar, India, allocation of title to men but not women led to increased drunkenness and domestic violence. Similarly in the Mwea irrigation scheme, Kenya, failure to guarantee women's rights to land led to a reduction in their well-being. If a woman

has the 'reservation option' to work and earn on her own land, it also gives her power in social and economic relations, and makes participation in local political institutions more likely.³⁹

Legal and even constitutional rights notwithstanding, both inheritance and purchase of land by women face severe customary obstacles. The varying effect on farmland access and poverty is summarized in Box 3.8.

There are other ways besides giving women access to land to bring gender concerns into the foreground: via other assets, notably education; via microfinance, as in many IFAD-supported activities; and via technology, for example, of rice production in IFAD's experience in The Gambia. Agarwal argues for concentrating on the land asset because of the 'feminization of agriculture': the movement out of agriculture has been faster for men.⁴⁰ Hence, female-headed households in rural India increased from 20% to 35% in 1970-96. So it is increasingly inefficient and unjust if land law, custom or practice deny women effective control over farmland. In much of Asia, and increasingly other developing regions, too, little public land is

Box 3.8: Obstacles to the purchase of land by women

In **South Asia**, most daughters in all Indian States do not inherit land, though legally eligible. Some tribals customarily give unmarried daughters usufruct rights; in Bihar, India, some Ho women remain unmarried to keep this access. In Rajasthan, a survey of three villages found that, of the 36 women with land in their names, 34 were widows; for 27, the land was registered with their sons. Most areas of matrilineal inheritance (much of Kerala, and many tribal land systems) show less gender-biased land control than areas of patrilineal inheritance. In Bangladesh, increasing numbers of women are making claims on their share of land. However, in Pakistan, little has changed.

In parts of **North Africa**, competition for access to land and historical customs can work against women even in situations where women have legal rights of access or inheritance rights to land.

In **East and Southern Africa**, poverty is explained much less by gender bias than by policy and institutional bias against all smallholders (men and women). In Ethiopia, there is no legal discrimination by gender. In Southern Africa, women can usually inherit land; male migration has left many rural women heads of household; female land control is common.

In **West and Central Africa**, poverty alleviation is closely linked to intra-household distribution of, and control over, resources and incomes. In Imo and Abia States, Nigeria, the average household farms 9.8 ha, but only 2.4 ha are allocated to women and then not as a claim on land but through lease, from their husbands, for a farming season. Even widows do not have land as it is kept in trust by their husbands' family for the children.

Sources in order of regions: Agarwal 1994; UN 1991; IFAD 1999a: 57 and UN 1991; IFAD 1999b: 47 and Odii 1997.

left. Unlike Latin America, land ceilings would not greatly increase the amount of land available (in 1996 in India, the surplus area above the ceiling was only 1.6% of arable land). Better access for women to private land is the only option.

The two routes are inheritance and purchase. Apart from customary and social obstacles to ownership by women (Box 3.8), even the wife's ownership (or, as in much of West Africa, day-to-day management and retention of usufruct) of particular plots often leaves the husband in control, because of social impositions on women: less school access and hence higher illiteracy; restrictions on mobility (and interaction with markets and public extension services) such as *pardah*; taboos against female farm tasks, for instance, ploughing or (in Southern Africa) cattle management. Perhaps, especially where fertility remains very high, women's family and household tasks militate against hands-on farm management in peak-season; yet women's farm productivity is usually at least as high as men's, so that their relative exclusion from land asset control is due partly to the structure of rural power, not only to physical realities or to women's own preferences.

The strength of custom and of male power make it difficult to identify practical changes to land systems that will improve women's land rights. In Mashonaland, communal land is allocated only to married men, and inherited only by sons; in Swaziland, land is acquired through inheritance or application to the local chief, but women very rarely get land in this way. As for distributive land reform, in four of 13 Latin American countries which desegregated gender data on reforms in the 1960s and 1970s, women formed only 4-25% of beneficiaries, as land titles were given mainly to household heads. In India, though West Bengal's 1970s Operation Barga covered female-headed households, few received land in practice. In Midnapur, of 107 000 ha, 98% was distributed to men; even in 90% of female-headed households which

received land, it was only for sons. Of 18 single women, only eight were given land. No married women were given joint title with their husbands.⁴¹

Thus, neither traditional nor reformed landholding systems have much increased women's share of farmland. Though more women than men depend on agriculture, many fewer own land. Where they do, their ability to use it to its full potential is usually limited by inferior access to inputs, credit and extension, and by low mobility. Where women gain land-use rights through male kin, men may still control key aspects of land use; women's rights often end with divorce (or even the death of the husband), forcing women to return to the natal home, often with no access to land. Massive reforms of women's legal rights, such as inheritance, even embodied in constitutions, though desirable (and quite widespread), have usually proved slow and ineffective in getting land assets to rural women, especially the poor, in face of male dominance and religious and customary law and practice. In spite of Agarwal's interesting small-scale examples of successful collective action by women to secure individual control of land,⁴² the issue has so far proved largely intractable by markets, reforms and laws – and even by selective male movement from villages to cities. More thought, and more carefully selected actions, are needed to address female disadvantage in land access effectively.

*The rural poor and the land asset:
conclusions, donor implications*

More widespread access to farmland assets remains central to rural poverty reduction. The poor acquire land directly. Indirectly, smaller and more equal holdings lead to increased employment and more demand for rural non-farm products. Supposed substitute reforms (assaults on tenancy or communal tenure; enforced state or collective farming) have failed. Much redistributive reform into family farms has taken place, with generally good outcomes, but the classical land reform

Box 3.9: Partnerships and actions that contribute to successful agrarian reform

Where it is possible to merge the interests of civil society, intergovernmental organizations and governments into a common effort, the synergistic effect on rural reform can be promising. The Popular Coalition to Eradicate Hunger and Poverty suggests the following plan:

1. Supporting alliances among sectors

- Build broad-based political and economic support for land-tenure reform, access to farm inputs (including credit and technology), and protection of the natural resource base.
- Inform the general public, through educational programmes, that smallholder farms are potentially more productive and environmentally sustainable than large-scale commercial agriculture.
- Establish coalitions of urban and rural peoples around such common concerns as the effects of the rural exodus on rural economies and urban poverty.
- Promote innovative opportunities for public debate on citizen resource rights and the role of sustainable agriculture in improving rural livelihood systems.
- Strengthen the collection, analysis and sharing of knowledge of the innovative approaches to land reform that can overcome the constraints experienced in earlier models of agriculture-sector reform.

2. Assisting governments

- Establish appropriate legal, regulatory and judicial frameworks that can register and protect people's resource rights.
- Promote the ratification and application of existing international conventions relevant to indigenous people and their communities and promote the adoption by the General Assembly of a declaration on indigenous rights.¹
- Establish independent and accountable land commissions, with adequate participation by potential beneficiaries.
- Ensure that women's names appear on land records, that their rights be enshrined in communal property systems, and that the inheritance rights of widows and daughters be established and protected, and promote representation by women in local decision-making bodies and on land commissions.
- Halt the expansion of the agricultural frontier on to fragile lands.
- Remove the subsidies and tax provisions that provide distorting privileges to large-scale farmers.
- Establish land-tax systems, especially for under-utilized land and land held for speculative purposes.
- Develop methods for increasing finance for land reform and post-land acquisition services, including land banks, land-for-debt schemes and land for taxes.
- Strengthen land registries, cadastral systems and land-survey methods.
- Develop human capital by investing in rural schools, health facilities and extension services.
- Establish mechanisms for the speedy settlement of land disputes.

process has often been slow, statist and inadequately pro-poor. Also, post-reform family farms need appropriate infrastructures, especially for farm products requiring swift and coordinated collection and processing, or connected to liberalized or global market systems. New approaches to land redistribution address these problems, often with decentralized, consensusual, or citizen-driven reform processes.

The importance of land redistribution for poverty reduction is increased by:

- continuing growth of the workforce in rural areas;
- declining short-run prospects to raise employment by the growth in the yield of food staples;
- increasing awareness of the high, rising cost per job of employing the poor off-farm;
- exhaustion in many areas of the scope for increasing farmed areas sustainably, given the

3. *Strengthening rural people's organizations*

- Support consciousness-raising among landless and near-landless people regarding their rights and the opportunities for change.
- Strengthen rural worker and peasant organizations, ensuring that they include female-headed households, widows, indigenous peoples, lower castes and other marginalized groups.
- Foster the organization of communities into units of sufficient scale for viable credit and marketing systems that will be of interest to commercial service providers.
- Protect indigenous people's knowledge and strengthen the efficiency of their resource-management systems.²
- Demarcate and protect traditional forms of land tenure with, for example, the registration of common property and pastoral areas.
- Promote improved land-management and soil-conservation practices.
- Ensure beneficiary participation in land-valuation processes and in determining repayment terms based on available labour, production skills, the productive capacity of the land, available technology and projected profitability.
- Ensure the cost-effective provision of rural services by using community-based organizations to deliver government programmes.

4. *Working in partnership with international organizations*

- Leverage the moral persuasion and financial conditionality of international organizations in order to place issues of land and resource rights on national agendas.
- Elaborate participatory methods to assist governments and civil society in monitoring progress towards secure access to land and other productive assets in the context of the World Food Summit and the Commission on Sustainable Development.

1. UNCED, (1992), Chapter 26.4

2. UNCED, (1992), Chapter 26.5

loss of farmland to degradation and urban expansion; and

- the especially limited and low-quality land rights of many ethnic minorities and many women.
- Some of the costs of consensual land distribution can be borne by beneficiaries through long-term credit, but too much of this creates a debt trap and may force land disposals in bad times. And even partial compensation of losers in consensual land

redistribution is expensive. So are complementary public (or in some cases NGO) infrastructures to facilitate private and competitive provision, often via former large farmers, of smallholder-friendly, competitive transport, input and output marketing, finance, research and extension, and credit.

Successful land reform can benefit from the lessons of the past. These point to a number of practical actions involving rural peoples' organiza-

tions, governments and international organizations. These actions have been consolidated from lessons gathered from around the world by the Popular Coalition to Eradicate Hunger and Poverty (Box 3.9).

WATER-YIELDING ASSETS AND POLICIES AGAINST RURAL POVERTY

Assets, water and water crisis: selection responses that do not harm the rural poor

Water is vital to most production. One third of cropland is irrigated in Asia (growing about two thirds of its crops by value), but less than 5% in sub-Saharan Africa. This partly explains Africa's generally lower yields, cropping intensity and food security. Water is also vital to consumption. Low-quantity and -quality drinking water in most developing countries harms health, and indirectly productivity, above all among poor rural households. These have least water security in production and consumption, partly for want of water-yielding assets (taps, wells). Hence they have less, worse or more unreliable farm water than others, and must divert calories and earning-power – a most always mainly female – to fetch water for many hours each week.

Remedies face several obstacles. First, water is becoming scarcer and less reliable in much of the world. With increasing populations and farm use, groundwater tables are falling; many major dams increasingly face management problems and are perceived as environmental threats; declining real prices of farm products, too, have undermined arguments for irrigation construction and maintenance. Second, pervasive water subsidies encourage waste, and are steered to the rich, who control most water-yielding assets. Third, there are strong and understandable pressures to divert commercial water offtake in low-income countries away from agriculture – now using over 75-90% and paying far below market rates – towards thirsty townspeople who are willing to pay. Given the importance of

water resources and control for the rural poor, how can the amount, efficiency and poverty impact of water and water-yielding assets be enhanced?

Water can be stocked in tanks or rivers, but outflows deplete the stock. Someone who controls water has a once-for-all source of value, which can be consumed or sold, but not an asset, like farmland or housing, which yields repeated returns. However, the controller of a water-yielding asset can often generate sustainable returns, as with farmland.

The water crisis and poverty

This raises two issues.

1. Given the amount, distribution and control of water-yielding assets, can the amount and use-efficiency of water, and benefits from it – and the poor's sustainable access to such benefits – be improved for life, health, comfort and escape from poverty?
2. What shifts, in the amount, distribution or control of water-yielding assets, might improve the amount, sustainability, or poverty impact of water benefits flowing from them?

Scarce and low-quality water in many developing countries, most critically in Near East and North Africa,⁴³ already restricts development, health and poverty reduction. In the next two decades the water constraint will tighten, and affect more countries, due to population growth, urbanization and probably climate change. Further, many aspects of water use threaten sustainability. In most developing countries, heavy subsidies and other public policy towards water use – and current allocations within agriculture – are unsustainable.

Yet rural water need is a generally underemphasized, rural contribution to water inefficiency and environmental harm is overemphasized, and the case for shifting water from farms to cities is overstated. So steps to meet the crisis may further harm the rural poor by steering water away from them. Though subsidies to water use, rural or

urban, are inefficient, many proposals to axe water use for farms overestimate how much water farms 'use up' (as opposed to 'use') and the ease of transferring it cheaply to urban domestic use. Sustainable, poverty-reducing farming in many low-income areas, especially in Africa, will need more irrigation, not less. As water gets scarcer and subsidies fall, expensively irrigated areas will rightly shift from staple foods to high-value products such as horticulture; but, correspondingly, many rainfed areas will require supplementary low-cost irrigation for higher-yielding cereals.

The World Water Council⁴⁴ gives pride of place, in slashing water waste, to (a) water pricing and (b) water users' associations. These matter, but so also do (c) drainage, (d) more incentive and technology for adequate, non-polluted re-use of water, after initial use, and (e) breeding water-economizing crop varieties. Focusing water benefits on the rural poor further involves (f) getting water-yielding assets to them, and (g) saving water by asset choices that use labour (especially in slack seasons) rather than capital – cross-bunding rather than centre-pivot irrigation. Water scarcity and movability are regional and watershed-specific; in many areas (such as the Eastern Cape in South Africa) there is spare water, which could be cost-effectively used to provide irrigation to poor smallholders. In general, priority recipients of more, cleaner water are often rural.

Water, rurality and poverty: facts and implications

The facts about water are striking.

- *Scarcity*: by 1992, 8% of people in sub-Saharan Africa and 53% in Near East and North Africa lived in countries with water resources below 1 000 m³ per head a year, defined as severe constraint.
- *Deterioration*: 50 countries suffer severe constraint or are water-stressed (1 000-1 600 m³ per head a year) in 2000 – as against 40 countries in 1990.

- *Quantity and quality* create separate health problems: adequate water availability alone would cut child diarrhoea morbidity by 25%; adequate quality alone by 16%.
- *The poor suffer more*: the richest income quintile in Peru, the Dominican Republic and Ghana is, respectively, three, six and 12 times more likely to have a house water connection than the poorest.
- *Rural quality is worse*: in developing countries, 30% of rural and 18% of urban people lacked safe water; respectively, 82% and 37% lacked adequate sanitation. (Bad maintenance, especially in rural areas, makes matters worse than these official estimates.)
- *The rural poor are worst hit*, being more reliant on unprotected shallow wells and less able to adopt preventive measures such as boiling water.
- *Agriculture is the main water user*: it consumes 88-95% of annual water withdrawals (from rivers and aquifers) in China, India, other low-income countries, and sub-Saharan Africa overall; 69% in middle-income countries; and 39% in high-income countries.
- *Farm water subsidies remain huge*, though less than in the early 1990s (when farm water users seldom paid more than 10% of operating costs, and hardly any costs of capital or maintenance). IFAD project work confirms that such subsidies make for water waste, impede maintenance and seldom help the poorest.⁴⁵

These facts – together with the impact on domestic water supplies as farmers exploit ever depleting groundwater supplies and pollute water with agrochemicals – suggest policy measures to shift water and/or water-yielding assets from farmers (who are heavily subsidized) to domestic users (who are willing to pay market prices). Water policy is doing this in many countries; in South Africa the target is to reduce agriculture's share of water off-take from its present 70% to 50% in 10-15 years. Apart from the undoubted need to slash subsidies

to water, water-yielding assets and water use (with appropriate safety nets for the poor), we suggest important caveats and more disaggregation and caution about any universal thrust to divert water from farming, given the impact of that thrust on the efficiency and equity of the rural-urban, rich-poor, and farm-non farm water splits.

- Municipal and industrial water withdrawal is often already increasing much faster than withdrawal by agriculture. For example, the presence of 31 textile firms in the Ciwalengke irrigation system, West Java, has reduced available water for irrigation, fishing and domestic use.⁴⁶
- Using water need not mean using it up. Much farm water is recycled through surface or underground transfer downstream; the most efficient policy may well be incentives, institutions, or interventions to improve the quality of recycled water (by substituting better crop varieties for some agrochemicals) or its quantity (through less evaporation or better drainage). Industry and mining seem more likely to use water up than agriculture. Many processes add chemicals that render the water unsuitable for re-use. Much industry is near coasts, so that used water runs into the sea.
- Substantial local irrigation expansion, especially of minor schemes with run-off or recharge usable elsewhere, is often consistent with national emphasis on industrial or domestic needs.
- The rural poor, already hardest hit by water scarcity, are likely to be increasingly exposed if global warming brings higher evaporation rates and less reliable rainfall – and are the least able to buy their way out of damage. They need safety-nets in the event of policies to desubsidize water use, as is often indicated on efficiency grounds.
- Agriculture often pays higher implicit taxes than other activities (for example, through trade policies); cuts in farm water subsidy should not be delayed on these grounds, but should be at least matched by reductions in such 'taxes'.

- Complementary policies should aim to save farm water by labour-using methods, and to shift control over water and water-yielding assets to the rural poor.

Farm production, water and water-yielding assets for the rural poor

Irrigation has induced huge rises in farm yields, cropping intensity, and thus both smallholder and employee incomes, taking hundreds of millions out of poverty and reducing their vulnerability to poor rains. The Green Revolution of 1965-85, which induced huge falls in rural and urban poverty, has had much more impact on production and poverty in irrigated areas than elsewhere. Despite the need to refocus new farm technology on rainfed areas, reversal of past progress with irrigation, or failure to spread it where suitable, especially in Africa, would be a tragedy for the poor, and for world soils; if the poor cannot get enough work and food from well-watered lands, they and their suppliers will be driven to overfarm fragile drylands. Farmer-controlled or improved traditional microirrigation has been unduly neglected in favour of uneconomic modern schemes, notably in West Africa.⁴⁷ But the accumulating problems of large dams must also be addressed; larger-scale irrigation remains essential to the environmentally sustainable food and jobs needed to fight rural poverty.

Irrigation can both improve yields and reduce rural poverty. The IFAD-supported Southwest Rural Development Project in Bangladesh installed tubewells and provided input credits to the poor; after five years, net returns to a typical small (one-acre) farm rose by over 50%. But do the poor obtain the water-yielding assets? Though at national level in India small farms are more likely to be irrigated than big ones, this is mainly because in ill-watered lands more area is needed even to survive. Irrigated parts of India have far less poverty and variability. Within most

Indian States, large farm size tends to accompany access to irrigation and hence multiple cropping. And locally the non-poor usually have more or better irrigated land than the poor. In Andhra Pradesh, India, large farms are concentrated at the head end of the Tungabhadra Left Bank Canal and smaller farms in the tail-end reaches; the poor thus obtain farm water later and less reliably. Water access is often also conditional on access to other resources (such as credit) and to political representation. In South India 'organizational connection' is an important influence on water distribution. Irrigation bureaucracies are often biased towards the more (financially) powerful in the setting of rosters for water distribution.⁴⁸

For women, access to irrigation assets is especially challenging. In Kenya, since claims on water are allocated within the community through contribution to maintenance (carried out by men), women cannot obtain water-yielding assets directly. They must pay men for irrigation water; some widows have had to give up irrigated farming. In Burkina Faso, some women are lent irrigated land in the dry season in order to grow vegetables; in Ecuador, women are heavily reliant on social networks. In such cases women obtain water rights annually and *ad hoc*, rather than secure claims on water-yielding assets. Access is unsure and conditional, partly because it is linked to women's limited rights to land. Unfortunately projects that address this problem by providing irrigation for a crop traditionally farmed by women, without a change in power-structures, incentives or social norms, may cause the crop to become a 'man's crop' alongside control over the water-yielding asset, as with rice irrigation in an IFAD project in The Gambia.⁴⁹

Even such partial participation in irrigation projects may be in women's interest. Women's consumption improved in the case of The Gambia, though their status and asset control did not. Also,

they may be able to use the water for domestic needs. But public, non-government organizations (NGOs) and donor stakeholders can facilitate irrigation incentives, rules of participation and management, and organizational forms that allow for women's and female-headed households' farming and other needs. A large Bangladesh NGO, Proshika, has financed and trained mainly women's groups to control water-yielding assets and sell the water mainly to male farmers.⁵⁰

Given total water supply to agriculture, the poor can gain more from water or water-yielding assets by either redistribution or improved efficiency. Can the two go hand-in-hand? How will the poor's share of water-yielding assets affect water efficiency, which includes sustainability? Land usually yields at least as much in small farms as in large, but what about water? There is little evidence, but the same principle probably applies to water. Large, rich farmers would find it paid to save water (like land) by using capital; small farmers by using or hiring labour. Overall, economic efficiency of water use in agriculture is low; it would pay society (if not always the individual farmer) if more were spent on reducing, among other things, spillage, leakage, infiltration, evaporation, clogging of water with weeds, failures of drainage, diversion of water to drown weeds (as on the IFAD-supported Kirindi Oya Irrigation and Settlement Project in Sri Lanka), and impediments to river and aquifer recharge through mistimed or mislocated irrigation or drainage. What can be done?

- Public works with slack-season labour, as in the Food-for-Work Programme in Bangladesh and the Employment Guarantee Scheme (EGS) in Maharashtra, India, can help with irrigation and drainage maintenance.
- Reducing or removing water subsidies normally increases incentives to avoid waste.
- So does reduced prestige (and sometimes corruption) for the construction and water-delivery

aspects of big dams, and more for the vital but unfashionable maintenance side.

- Economic efficiency in water use, and hence more water for the poor, could also be advanced by better integration between water and crop research, extension and delivery systems.

What sorts of irrigation-yielding assets benefit the poor most?

Small-scale, farmer-managed irrigation schemes include small tanks and non-grid shallow wells, mainly in Asia; and, mainly in Africa, valley-bottom irrigation (*fadama*) as in Nigeria, minor stream diversions (*molapo*) as in much of Southern Africa, sandriver diversion, and rainwater catchment schemes. Such schemes can be low-cost alternatives to large irrigation projects, easier to manage bottom-up, rooted in locally relevant traditional knowledge, yet often with good rates of return due to associated enhanced crop and water management. Moreover, they often provide the very poor with access to water for irrigation. In India small individual wells were the form of irrigation asset most associated with smaller farms in the late 1970s, followed by tanks, with formal dam systems and tubewells – requiring purchased or negotiated access to substantial assets – far behind. In Latin America, most irrigated rice lands are minor schemes developed by farmers diverting water from streams, rivers and wells. In the Philippines, almost half the irrigated land is watered by such small schemes, involving local associations. Box 3.10 shows the role of *dambos* in Southern Africa.⁵¹

Small-scale irrigation schemes can have clearer rules about distribution and maintenance. Members can be few, close and homogeneous; institutional arrangements can be local and quick; and women may be able to participate more. However, there are limitations on small-scale, member-controlled schemes. There is no outside agency to bear the risk; lack of financial or bor-

rowing capacity can retard uptake and investment, damaging growth and equity. Small schemes tend not to cover entire watersheds or aquifers, increasing the downstream problems; these require negotiation if inequity is to be avoided.⁵² Above all, the design and management of irrigation is often uneconomic, or even infeasible, at levels too small to allow for the borders, slopes, flows, water resources and channels of large and integrated watersheds, or even river-basin systems.

For such reasons, and to exploit some underused African lakes and rivers efficiently and sustainably, large-scale projects, often with dams, will continue to be needed. They can indeed concentrate water on elites and head-enders; link them to the leaderships of sometimes corrupt irrigation bureaucracies, raising water uncertainty for tail-enders and the poor; weaken overview and participation in maintenance,⁵³ resulting in long, frequent breakdowns which harm poorer farmers most, as they cannot afford alternative, private access to water; and risk passing 'thresholds' of environmental damage, leading especially to salinity and waterlogging as in parts of Pakistan. But such problems often have been overcome as water markets spread. The poor may not own a share of any major system, but they can buy water. So must better-off head-enders, who then often switch to groundwater systems, leaving the surface water to be bought and controlled in part by the poor.

Groundwater pricing has complex effects. It is surprisingly popular: farmers may neglect subsidized (but frequently inefficient) public tubewell or borehole supplies and pay high prices for reliable private supply, as in Northern India. However, as more and more tubewells are sunk and used, the water-table falls, damaging the (usually poorer) farmers and householders with shallow dug wells or tubewells. However, water markets can provide access for the poor, even if they own neither pumps nor deep wells; in Mexico, poorer *ejido* farmers have good access to surface

irrigation, because less-poor private farmers have sunk tubewells to water their high-value crops. In Bangladesh, small farmers benefit more from deep tubewells than large farmers; as they are more likely to grow high-yielding varieties, it pays them to irrigate a larger percentage of land.⁵⁴

The poor are well placed to benefit from shallow wells as long as they are not fighting a losing battle with deeper wells for groundwater. In one area of Bangladesh, access to shallow wells benefited the poorest more than deep tubewells or land; landless households bought very low-capacity

pumps, designed for drinking-water use, and moved them around farms, pumping water day and night for sale to farmers in peak seasons – a labour-intensive and uncomfortable activity unlikely to attract the rich, but a lifeline to the poorest. The capital costs per unit of water delivered are lower (but the labour costs higher) than for those of deep tubewells, making shallow tubewells more accessible and attractive for the poor. Also, handpumps need not require large outlays for fuel. For example, the treadle pump, pioneered in Bangladesh, can be used on shallow wells,

Box 3.10: Farmer-run *dambos* in Zimbabwe

Why is less than 15% of sub-Saharan Africa's irrigation potential exploited, far less than elsewhere?

- Partly due to reliance on foreign consultants/contractors with market power, extra full-control medium/large irrigation is more costly per hectare: USD 8 300 (1995 dollars) as against USD 6 800 in North Africa and USD 2 500 in South Asia. Adding indirect costs for social infrastructure, development costs in Africa approach USD 18 300 per hectare. Small-scale irrigation with full water control is no cheaper if farmers' labour and survey costs are fully costed.
- Many past irrigation investments did badly. In the 1980s, of 15 projects with World Bank funding, five showed returns above 10%, but six had negative returns. Matters improved in the late 1980s and 1990s (with more normal climate and less anti-agricultural price bias): average return on 11 gravity projects was 9%, for seven pump projects 13%, and for five mixed projects 14%.
- Many projects are not financially or environmentally sustainable, and managerial capacity is often lacking. Government-controlled small-scale schemes did no better than large-scale schemes, despite greater promise.

Can small-scale, farmer-controlled irrigation expansion help? In Zimbabwe, irrigated gardens in *dambo* wetlands illustrate low-cost indigenous water management. Control by local communities, allocating land for garden cultivation, is an advantage over many formal irrigation systems, allowing flexible water management.

Dambo farmers fence a plot and dig water channels between beds, often adding a shallow well. Water reaches the plants mostly through sub-irrigation in the root zone. Investment is below USD 500 per hectare, making *dambos* more affordable for the poor than standard irrigation (USD 2 000–USD 10 000 per hectare); farmers bear the costs. *Dambos* yield about twice the return to land and water of standard irrigation; flexible water management lets farmers diversify into high-value horticultural crops.

Despite their potential, new *dambos* have been banned in Zimbabwe since 1975 to prevent erosion and protect downstream flows. Yet, if indigenous management practices are used without deep drains or mechanized pumping, *dambos* need not be erosive, and the water not used by the crops still flows downstream. Since *dambos* are far more productive than dryland farming and are the main source of production for smallholders in communal areas (and cause less soil and water erosion), they can relieve pressure on upland resources. At present there are about 15–20 000 ha of *dambos* in Zimbabwe, compared with 150 000 ha of formal irrigation, of which a much smaller proportion is controlled by the poor, and with potential to develop another 60 000 ha. *Dambos* are also extensive in many other parts of Southern and Western Africa, particularly Malawi and South Africa. *Dambo* cultivation seems especially promising for the rural poor: most *dambos* are located where most of them live; they support labour-intensive horticultural crops, yet give a decent return per man-day. But expansion requires legal acceptance, improved marketing, and institutions to prevent over-exploitation of water.

Sources: Rosegrant and Perez 1997; Jones 1995; Rukuni et al. 1994; Meinzen-Dick and Makombe 1999; Hazell et al. 2000.

requires low capital investment and uses human energy; in 1989 most users were very poor and there was high social acceptance. Although such schemes cannot serve many farmers or large areas – the wells are shallow or produce only small amounts of water at a time – there is much potential for individual smallholders.⁵⁵

*Productive water and water-yielding assets
raising the poor's access and gains*

With appropriate policies including safety-nets, desubsidization and water market access can greatly help the rural poor to control water. However, control over a water-yielding asset provides more water security. How can water-yielding assets for the rural poor be increased, or made more productive?

- Well and pump permits can regulate pumping of groundwater resources, with fines or shutdown for over-pumping. This could benefit poorer farmers who use shallow wells. Despite serious risks of rent-seeking and corruption by regulators (harming the poor), the downstream and distributional effects of unrestricted private pumping are so significant that regulation is becoming almost universal.
- Irrigation technologies need to respond to the needs of the user. For poor farmers this often means building on traditional methods such as *dambas* (Box 3.10), or introducing low-cost technology that is easy to operate and maintain. Yet large systems, with top-down water management, provide many poor people with water, work and food; though serious sustainability and management problems have usually developed, they can be corrected with more participatory management and appropriate new technologies such as rotational irrigation and cross-bunding.
- The poor can be helped to invest in their own wells, pumps and so on, with credit, technical assistance, input distribution, extension and the

provision of hydrological data. Ownership of irrigation equipment can be feasible even for the landless.

- Water asset acquisition illustrates how the poor can be helped by appropriate management of – and, even more, civil-society influence by the poor upon – the current shift in the role of stakeholders. In that shift, governments reduce their role in production and subsidy, and create incentives which encourage competitive private provision for the poor. However, experience with water, with its many externalities and long-term effects, shows that for a pro-poor government creating an enabling environment for the private sector through law enforcement, mass education and information is necessary but not enough to benefit the poor. Government needs to target benefits to them, in its role as facilitator, provider of safety-nets and regulator of external and hidden impacts, and farmers and labourers need to control more water-yielding assets. Since the poor use their labour to save water, this should increase efficiency in water provision and use.

Water user associations can help keep water-yielding assets, especially degraded large-scale public irrigation systems, well-managed, responsive to users and sustainable. But even on small-scale irrigation projects in West and Central Africa, the poor have barely participated in them.⁵⁶ Labour contributions to a system should be recognized as a substitute for financial contributions, so the poor can legitimately and easily gain access to water for irrigation. Water user associations can also help ensure that those at the head-end and tail-end benefit equally, as efficient and equitable irrigation performance depends on cooperation of all affected by an irrigation system. With adequate planning where farmers know the schedule for the canal and are active in decision-making about the distribution method,⁵⁷ more equitable access to irrigation should result.

Access for the rural poor to water and water-yielding assets for consumption

In consumption, too, water waste and wrong price incentives go alongside worsening global shortage and severe local scarcities, yet are addressed through policy priorities reflecting the power and interests of the urban rich. For example, urban health damage is rightly addressed by public measures to improve water supply and sanitation; yet much less, per resident, is spent to address graver rural problems.

In many developing areas, scarcity, remoteness and pollution of water for consumption impose heavy collection costs and damage health, particularly of children.⁵⁸ The burden is heaviest for the rural poor. Better domestic water would also raise their returns from other assets such as land. Educational asset-building also suffers when girls must carry water, or children miss school because they are ill with water-borne diseases.

Yet, to have the best impact on health, clean rural water requires complementary sanitation and hygiene education. In Imo State, Nigeria, water at the borehole was clean, but became contaminated in transportation, storage and contact with users' hands. Even a bundle of health-related water policies – clean supply, sanitation, education – may be much less cost-effective in reducing mortality among the rural poor than similar outlays divided between such policies and measures to improve child nutrition directly, as in Narangwal (in the Indian Punjab) in the 1970s. Nevertheless, a comprehensive review of over 100 studies of the effects of feasible water and sanitation improvements in developing countries in 1990 suggested that they would reduce deaths from diarrhoea among under-fives by two million a year, one fifth of such deaths from all causes.⁵⁹ The incidence of disease, and the potential benefit from water improvement, are greatest for the rural poor; so is the difficulty of maintaining and sustaining equipment to improve water quality, and of recruiting sup-

port for the costs from influential people exposed to infection.⁶⁰

Health damage from dirty water apart, poor rural women and children now incur much time, effort, calorie loss and exposure to insect vectors while collecting water, especially in remote drylands. A village handpump or standpipe reduces the burden of water transport over long distances, reduces water losses, needs and contamination, and brings further gains to health.⁶¹ In a Mozambican village with a standpipe in the square, women spent only 25 minutes a day collecting water, as against 131 in a village where access to water meant a two-hour round trip; in the standpipe village the average woman enjoyed 433 minutes of rest daily (compared with 385) and more water was used.

How to increase access to consumption water, and to related assets, for the rural poor

The International Water Decade launched by the UN General Assembly in 1980 sought 'water and sanitation for all'. Thousands of water supply systems were installed, but fewer were maintained. In rural areas, dispersion of settlements impedes water provision and maintenance. Also, population growth masks the gains. By 1994, 800-850 million rural dwellers still lacked 'formal' water supplies.⁶² Many villages lack even communal handpumps and use river water, springs, tanks or hand-dug wells with a rope and bucket, raising transaction costs and harming health. Some rural people get water from vendors, but often at a high price. In El Nahud, Sudan, some poor families spend up to half their cash income on drinking water.⁶³

Slow progress is partly due to lack of funds, but more to the types of technology and lack of effective incentives, information and institutions for poor users to manage and maintain these systems. In the 1970s, at least 70% of handpump projects were not sustainable.⁶⁴ Technologies, and systems and incentives to maintain them, need to be

appropriate to rural realities. This often means 'non-grid' water-yielding assets, each controlled by one poor household (or a few closely linked).

Wider-scale community approaches require shared, and policeable, community interests and contributions. Village Level Operation and Maintenance (VLOM) was introduced in the 1970s to give the community control over their water supply, minimizing pump downtime through simple community maintenance and quick response to breakdown. This requires an easily maintainable handpump, locally available spare parts, a paid, trained villager responsible for maintenance and repair, and therefore regular payments into a village fund. Although sometimes effective, VLOM has shown serious weaknesses. Donors overlooked many local technologies. Hardware was emphasized (and often complicated by variations among donors) at the expense of local training, maintenance and management. Social acceptance or appropriateness was often not realized, and a reliance on imported parts limited opportunities for communities to take control of their water supply. Users often thought that the institution that installed the handpump had ownership, and were thus reluctant to take responsibility for operation and maintenance. One IFAD drinking water rehabilitation project experienced badly organized villager participation in management, compounded by reliance on outsiders for spare parts and fuel, harming sustainability.⁶⁵

Funds and organization to provide training and incentives to individual or group maintainers are crucial to success in rural community water supply. In India, as part of the United Nations Children's Fund (UNICEF) water supply projects, women, the main managers and users of the water, were trained in pump maintenance and repair. In one State, a cooperative of women mechanics was later contracted by the State government for rural pump maintenance and repair. In another, land-

much scope for income generation if these skills can be learned.⁶⁶

To retain the desirable aspects of VLOM while avoiding the top-down choice of assets and technology that damaged much of it, the World Bank promoted the Demand Responsive Approach to Water (DRAW). Communities start this process, making informed choices about their project and how to fund it. This move away from supply-led water systems could increase coverage, reduce waste, enhance community participation and improve maintenance and sustainability through a sense of ownership. Under DRAW, water is seen as an economic good, and in all countries studied (Benin, Bolivia, Honduras, Indonesia, Pakistan, Uganda) the rural poor proved willing and able to pay the recurrent (and some capital) cost of supplying water, if it is clean and reliable.⁶⁷

However, even modest water charges could exclude the very poorest. Moreover, if they do buy the water, they have even less to spend on basic food. This makes a case for contribution in the form of labour. In the Swajal project in India, poor communities in the hills contribute only labour to the capital cost of the water-supply system. A water institution should also build on communities' altruism; many will, at the extreme, share their well with those who cannot contribute; in others, subsidies are arranged internally. In a village in Swajal, the community undertook a wealth-ranking exercise and asked the poorest to contribute less. In Tanzania, widows were exempt from handpump maintenance funding. Systems such as DRAW require not only community/group financial or labour contribution but often also a shift by the state from provider to facilitator and water-quality regulator (though the World Water Commission rightly stresses the state's welfare role as at very least the water provider of last resort) and an increased role for NGOs (to facilitate demand) and the private sector (providing pumps and spare parts). It is crucial that incentives and

institutions are appropriate to induce the stakeholders to undertake their new roles.⁶⁸

The key points for sustainable rural water supply systems to reach the poor are:

- response to demand, expressed through willingness to pay or to contribute labour;
- user financing of at least the recurrent costs;
- technology appropriate to the service level demanded by a community, and practicable to operate, maintain and repair, with affordable and locally available energy and spares;
- water groups, from a few households to community committees, to administer financing and to operate, maintain and repair their own part of the water supply system; such groups to include the working poor, especially women, in ways that do not overburden them;
- complementary hygiene education, sanitation and nutrition support for growth-faltering under-fives and pregnant women, to achieve the most cost-effective impact on health;
- subsidies targeted effectively, so government budgets are released for increased coverage, while taking account of the willingness of some communities to cross-subsidize; and
- appropriate institutions and incentives for all stakeholders, including the state 'water safety-net', to act properly.

LIVESTOCK ASSETS AND THE RURAL POOR

Benefits to the poor of controlling livestock assets

In many poor regions⁶⁹ the rural poor depend heavily on income from livestock production, but can seldom afford to eat animal products; they must usually trade them for staples with lower costs per calorie. Yet paradoxically the poor (a) depend most on livestock income, not where trade is easy and cheap, but in sparsely populated drylands where trade involves high transaction costs, and (b) control relatively few large stock, that is, the livestock with more regularly and readily traded products (such as cattle, water buffalo,

camels). Explaining this paradox suggests the livestock products, assets and policies that can improve the livelihoods of the poor.

In arid areas, extensive or transhumant large stock-grazing is the only way to support many people from land use. In semi-arid areas, large stock supplement coarse staples (maize, millet, sorghum, roots and tubers) as a source of income. In Asian and some African semi-arid regions, livestock are integrated into smallholder and labourer livelihoods through mixed farming systems, providing draught power and manure for cropping, and living off crop residues as well as grazing. Large stock enhance land and labour productivity through draught power in large areas with physical or economic conditions intermediate between those suitable for tractor and for hoe cultivation.⁷⁰ The poor can benefit from livestock asset control, especially in areas of newly settled or expansible land frontiers, but only with appropriate institutions for acquisition, management and trade. IFAD's Smallholder Cattle Development Project in Sumatra provided transmigrants with draught animals, to be paid for in kind by returning two offspring within five years. This increased average cultivated area from 1.4 ha to 2.3 ha doubling incomes.⁷¹

- Livestock produce several benefits for the poor:
- They provide food direct; the poor consume a little of this but sell more for cash, which is then used to buy staples.
 - Livestock manure can be used as fertilizer or fuel.
 - Livestock 'embody' saving in a pro-poor way, with yield extracted largely by labour (for example, milking).
 - In bad times animals are sold, and many are kept with this in mind.⁷² However, when hardship, such as drought, strikes almost everyone in an area, many seek to sell stock and buy grain – and the value of stock decreases as the grain becomes dearer. This cuts the food-security value of the poor's 'livestock savings', especially if, as in much

of Africa, livestock are very unequally distributed, with few potential buyers who have market power.

- Sale of livestock in hard times also acts as a buffer against loss of other assets. In Northern Nigeria, those without livestock at the beginning of a survey had 12% less land four years later; those with livestock retained the same acreage.⁷³

Given asset value, a mix of livestock and cropland often brings more income than either type alone because of close links between crop and livestock production, the flexibility each provides for the other (like choice of ploughing and manuring times), and difficulties with animal-hire markets. Zimbabwean smallholders who combine livestock and crop production, have incomes twice as high as those with only crops.⁷⁴ However, in marginal arid-to-semi-arid lands, livestock alone can be the only sustainable land use. In less extreme cases, drought risk to crops can exceed even the risk to cattle, especially for poor farmers with less prospect of water access in crisis.

Livestock bring new risks: illness, death, theft. Nonetheless, 'since crop income is risky, [a few] assets in the form of cattle [and] small livestock [are carried, to increase] risk-bearing capacity ... even at the cost of lower levels of income'.⁷⁵ It may reduce risk to spread one's portfolio even into risky assets, if some of the risks are weakly correlated (drought threatens both crops and livestock, but pests, theft and flood usually affect one much more than the other). Apart from often reducing total risk, livestock help in managing risk if they can be sold in bad times.

There are far fewer transaction costs of large stock if the controller also controls land; many of the poor do not. However, this can be overcome, enabling even landless households to keep livestock assets. Quasi-cooperative service arrangements, such as those pioneered in Gujerat, India, and now widespread under the National Dairy Development Board, collect milk daily from many owners (sometimes landless) of just one cow or

water buffalo, and sometimes provide small feed packages. Many communities have common grazing. Others practise transhumance, helping to move cattle away from drought areas, as with the Fulani in Nigeria (though the poorest often lack access to trek routes, or food for the journey). Even when land scarcity erodes such options, stall-feeding (zero grazing) increasingly allows the poor to substitute labour for land. Small stock, especially poultry, often have minimal land requirements.

Though the rural poor benefit from livestock asset control, it is often skewed against them. In Botswana, though most farm income is from cattle, the poorest 40% of farm households owned none. However, as in much of Africa, they could often exchange labour for some control of cattle owned by others, being rewarded for cattle-care with the rights to animal products, fallen animals and some calves (the *mafisa* system). In Bayan Tsgaan village, Mongolia, the poorest quartile of households had only 5% of privately owned livestock. However, in Madhya Pradesh, India, livestock ownership was less unequal than ownership of land,⁷⁶ as in parts of rural North India, where livestock income is over a quarter of the total, and more for the poor. In a village in Pakistan small farms obtain over half of their farm income from livestock, as against 30% on larger farms.⁷⁷

So the extent to which livestock are the focus for livelihoods among the rural poor varies greatly. How, if at all, asset policy should concentrate on getting livestock to the poor depends on the specifics. However, in Asia, Latin America, Near East and North Africa and parts of sub-Saharan Africa the 'livestock revolution'⁷⁸ is sharply raising the share of farm resources going to livestock, and the share of grain consumed by animals rather than humans. From such changes in asset structure and use, the rural poor – who still derive most calories, and employment incomes, from staples – are not, in most cases, well placed to benefit. Can they be helped to do so?

The poor, types of livestock assets and livestock asset policies

Poor farmers are less likely than others to own several species of animals, but more likely to own poultry, sheep and goats rather than large stock. Small animals are also much more often controlled by children and women (who in Senegal own 60% of sheep and goats). Effective pro-poor policies for animal assets need to recognize why poor households tend to own smaller animals – whether to support them in this, or to relieve constraints to their profitable and safe control of large stock. A number of reasons can be suggested:

- Small animals require less cash, capital and loans, relative to labour, to buy and maintain.
- Given herd value, more and smaller animals simplify distress sales and make death of an animal less risky.
- Small animals grow and breed faster, reducing pay-back period (the poor pay higher interest and have greater time-preference), diffusing risks from disease, and permitting mixed-age herds (even small ones have some animals mature and food-yielding at most times).
- Goats and sheep can thrive on harsher terrain and vegetation than large stock (benefiting poor farmers on marginal land) and contrary to conventional wisdom tend to do less harm in ecologically fragile zones than larger animals.⁷⁹

This suggests two ways to reduce poverty. Larger proportions of livestock extension, public-goods provision and research should aim at improving the labour-intensive management of small herds of small stock, for example, by better management of infectious diseases. Second, artificial or non-economic barriers to control of large stock assets by the poor should be removed through better access to small dispersed livestock auctions, as is attempted in Botswana, or through cooperative arrangements for rapid collection and processing of small amounts of milk.

Provision or subsidization of ranches, a popular livestock policy in Eastern and Southern Africa until well into the 1990s,⁸⁰ has proved counter-productive for the poor. Enclosing common land for ranching deprives their small stock (and their few cattle) of grazing; ranchers replace cattle guards with fences, cutting demand for the labour of the poor.

Control over livestock assets can help the poor even without ownership. However, the crucial savings/sale function of livestock is available only to owners; and large herd-owners are much more likely than small ones to displace employment with equipment. Nevertheless, livestock costs and benefits can be shared in ways helpful to the poor, as with *mafisa* in Botswana, or as in Nepal, where households owning more than five buffalo often lend one to poorer households and share the profits.⁸¹

Just as larger farmers of tobacco or cotton can become contractors for inputs and services, with the poor taking over the farming in small units and gains for all, so larger herd-owners may be well placed to switch to management, finance and sales of processing products (hides and skins, tanning, dairy processing). This creates new employment, often for women, while leaving the control of cattle increasingly to smaller herders. It is important and feasible for policy to encourage such shifts.

OTHER PHYSICAL ASSETS AND RURAL POVERTY REDUCTION

The rural non-farm sector

Poor households typically have diverse sources of livelihood, both to reduce risk and to provide income in slack farming seasons and bad times. While farming and hired farm labour usually predominate, the rural non-farm sector (RNFS) is becoming increasingly important as a source of income and employment for the poor. The RNFS now accounts for some 44% of rural employment

in Asia, and is growing over twice as fast as farm employment in India. The RNFS share of rural employment has increased rapidly in Latin America; in Brazil and Ecuador it reached at least 30% in the early 1990s. The proportion of rural incomes earned from RNFS has also increased in most cases, averaging 45% in 25 African country case-studies; in India the range is 25-35%. The proportion is higher for poor than non-poor households in many places (India, Pakistan, Mexico) but in Africa the RNFS share in non-poor incomes may be twice that of the poor.⁸²

The growth of RNFS is more labour-intensive, lower-skilled, stable, and thus pro-poor than urban non-farm growth. But the sorts of RNFS growth that reduce poverty usually work best where farm income, and thus local consumer demand, grows too. RNFS often comprises 'distress diversification' into otherwise declining crafts, because farming is doing badly. This can sometimes revive rural incomes; Botswana craft baskets are a striking example. However, almost all studies indicate that RNFS growth based on growth linkages to successful farmers and their employees, who demand booming services (construction, trade, transport), has a better chance to cut poverty. Most traditional RNFS participation, reflecting family skills, land shortage, or the need to diversify against seasonal unemployment or annual drought risk, is linked to poverty, so should not be neglected; but modern, linkage-based RNFS is a more promising way out of poverty.⁸³

Usually, poverty-reducing growth of the modern RNFS is more likely to arise from widely shared agricultural growth (leading to rising demand for local RNFS activity), and from interventions to provide the poor with appropriate skills, education and competitive nearby credit,⁸⁴ rather than with physical non-farm assets. Unlike agriculture, where one can identify public goods for farming, and public strategies for private asset support likely to reach the poor, RNFS is diverse in assets

required; the history of asset subsidization in the RNFS suggests that centralized intervention seldom picks winning techniques, sub-sectors, or potential entrepreneurs, or targets gains on the poor. Rural 'industrial estates' have a long history of failure and mistargeting, often subsidizing medium entrepreneurs against tiny, poor competitors. An IFAD report on microenterprise in West and Central Africa shows that most RNFS asset support leaked to the non-poor, partly because of the lower fixed costs of administering larger transactions: the mean loan size for the Alliance de Crédit et d'Épargne pour la Production in Senegal was USD 1 500.⁸⁵ India's Integrated Rural Development Programme (IRDP), intended to direct grants and subsidized loans to the poor for non-farm asset formation, had mixed results but is widely agreed to have been ill-targeted and cost-ineffective.

In remote areas, high transport costs can provide natural protection for RNFS, making it potentially profitable. Also, RNFS income can be a source of savings for farm investment. Yet RNFS itself seems often to need outside credit as a catalyst, more than does farm investment: Indian districts with good branch bank networks show faster growth in RNFS, not in agriculture. Often RNFS profit levels are dependent on local farm production: forward and backward linkages to agro-industry, and especially 'consumption linkages' to higher incomes, locally spent, for smallholders and farmworkers. Roads and communications, as well as bank infrastructure, often affect inputs and marketing more for RNFS than for farms.⁸⁶

Where land is scarce yet farm yields cannot keep up with the growth of rural working population, RNFS growth is needed to reduce excess pressure on natural resources, as well as to provide workplaces and keep poverty falling. Yet the modern, dynamic, RNFS sub-sectors, such as construction, transport and shops, seldom prosper where agriculture is stagnant. Traditional crafts and services are most likely to engage large proportions of the

rural poor, keeping them alive if not lifting them out of poverty. Policy should avoid undermining these sectors, for example, by supporting otherwise unviable medium-scale rural brickworks in 'industrial estates'. Conversely, artificial support for RNFS sectors associated with distress diversification, such as household-based craft products, is doomed, especially as competition from modern urban sectors and imports is liberalized. The best prospect is offered by appropriate regulatory and credit frameworks, public support for training, and other measures to revitalize RNFS by upgrading assets in very small units for the rural poor.

Such policies should be directed at a number of areas.

- *Public goods and facilitation of agriculture-RNFS linkages.* In North Arcot, India, a 1% increase in agricultural output is associated with a 0.9% increase in non-farm employment.⁸⁷ RNFS should therefore not become the focus of rural policy at the expense of agriculture. Policy should increase positive intersectoral linkages.
- *Support for RNFS activities induce the most and fastest poverty reduction.* Where growth is rapid in RNFS sub-sectors, entry barriers faced by the poor should be publicly identified and, where cost-effective, addressed. They include lack of finance; information about technology and markets; skills; and infrastructure.
- *Appropriate government regulation* (of construction or transport, for example) should avoid arbitrary imitation of Western or urban density or other aesthetic norms, and emphasize essentials for health, safety and competition. Implementation should be open, bound by simple published rules, concentrated on important cases, and enforced through civil-society pressures and light but applied laws.
- *Appropriate credit support.* Although many microfinance institutions, like India's IRDP or Bangladesh's Grameen Bank, target the RNFS, access for the poorest is very limited.

- *Human capital provision to give the poor the capacity to enter RNFS.* This need not consist of formal primary education. There is plenty of scope for basic literacy, numeracy and book-keeping classes which could improve the position of the poor within the rural off-farm labour market, if not enable them to set up their own profitable enterprises. Indeed, the ageing workforces of Asia and Africa mean that most of the working poor in 2020 have already completed formal education; in RNFS and elsewhere, it is too late to meet their skill needs that way.

Housing

The house often comprises the poor's main physical asset by value. For consumption purposes rural houses of mud or sticks are often worse than urban slums; the average rural standard of drainage, power supply and sanitation is far worse. As for production, whereas most urban people live and work in different places, rural people often obtain much of their livelihood in or near the home. The rural poor can benefit from 'fungibility' by adapting the use of space within the house between production and consumption, spare rooms and workrooms, and supportive labour between child care and outwork such as lacemaking.⁸⁸

Despite the importance of housing for the rural poor, housing and support policy have been overwhelmingly urban. The main thrust of urban anti-poverty policy, in sharp contrast to rural concerns, remains upgrading slums and improving shelter and supportive infrastructure. This has encouraged migration to cities, which has raised housing costs, reduced quality for the poor, and enlarged squatter settlements, with serious health hazards and congestion problems. This urban focus neglects rural areas where even worse housing (and other) conditions encourage urbanization.

A poverty-oriented policy for rural housing assets would first confront the problems of sea-

sonal intra-rural migrants, mostly for farmwork or construction (such as the *Torrentes* in parts of Latin America). Lack of dwellings have worse effects in rural areas than in cities on untreated illness, unprovided education, and unpoliced crime and violence against women. Second, public research is needed on (a) improving access for the poor to traditional housing materials (for example, thatching grasses), which have great advantages but are becoming scarcer or more distant because of deforestation and new land uses; (b) economizing on such materials by enhancing their durability; and (c) controlling pests, and instability during rainy seasons. In India more than half of the rural housing substantially uses mud bound with cow-dung.⁸⁹ Third, large local employment programmes in Bangladesh, Bolivia and India might test improved designs, based on local materials, to help with off-season house construction, maintenance and repair,⁹⁰ normally using small construction firms, not undercutting them with subsidies.

Apart from stimulating supply, policy can support rural housing by redistribution and service support. Land reform in Kerala concentrated more on house-plots and surrounding home gardens than on farms.⁹¹ Normally, the redistribution of house space must be consensual: the supply of inexpensive housing to the poor is reduced by rent controls, but increased by making rental markets better informed and less restricted. Also, there may be scope for rural site-and-service programmes in areas of severe housing deficiency. Where house waste-water can be safely applied, a garden used for home consumption or marketed vegetables often greatly enhances the housing of the rural poor, especially women.

Transport, communications and infrastructure assets
Rural roads in India and elsewhere deliver high rates of return. Bad roads in Africa make marketing margins – the gaps between farm and market

prices – far higher than in Asia; so rural people, especially remote and poor ones, can therefore benefit less from improved incentives and liberalization. In areas such as Wollaito, Ethiopia, off-take of fertilizers, and of higher-yielding maize and other crops, is limited by the huge costs of marketing over long distances along terrible roads. However, paving Africa is not a simple solution to rural poverty. In many drylands, returns to roads are depressed by sparse and dispersed population, low value added per square mile and per person, and small exchangeable economic surplus. In such regions the cost of building roads to many dispersed villages is prohibitive. Imaginative solutions are needed to reduce costs of transport grids, or to find affordable alternatives. One approach is through the size and location of stores. Another is to divert some resources from long and usually expensive rural-to-urban highways to short inter-rural roads, permitting specialization and exchange. A third option is labour-intensive maintenance (and some local contribution) to all-weather roads through rural areas. A fourth is migrating nearer water sources and outwork. A fifth is consolidating farm fragments (*not* farms) to save travel.

The gains of the rural poor from improved transport go far beyond market access. Apart from easier trips for schools, clinics, extension and so on, on-farm transport can relieve drudgery and save time. For the rural poor, most travel occurs within the village, mostly for subsistence tasks; transport improvements here could especially benefit women and children. In a Kenyan study, only 22% of journeys were for exchange; half were for farm work and housekeeping. In a Tanzanian village, 75% of transport time and 80% of tonne-km. involved women. In Ghana and Tanzania most movement around the village is on foot. Although the terrain and lack of storage capacity sometimes dictate head-loading for water collec-

tion, new forms of transport could help in collecting firewood.⁹²

Though roads normally raise output, choice and income for most people, the poor may gain little, because they seldom control the means of transport. Non-motorized vehicles, like bicycles or donkeys, can often meet the poor's needs relatively cheaply and reliably. In Uganda, of 715 journeys a day recorded at 55 points on rural roads, 75% were on foot, 22% by bicycle and only 2% motorized. In rural India, bicycle ownership was far higher among the poorer households. Credit-insurance schemes might help more poor people to acquire bicycles. Where households are not too dispersed an animal cart or bicycle trailer might be feasible; a trailer can quintuple a bicycle's load capacity.⁹³

At times modern communications can substitute for some transport. However, there is no content to most speculation about the Internet as a remedy for the transport and communication problems of the rural poor.⁹⁴

HUMAN ASSETS

Why shift human asset-building towards the rural poor?

Human assets, which capital 'embodied' in people, are in most ways like other assets. They are built up by sacrificing current consumption or leisure. They depreciate unless maintained. They help people controlling them, both by providing a cushion against bad times and by increasing income, welfare or capabilities above what can be achieved with heavy labour power. In this respect, human assets are becoming much more important, relative to physical assets, due to global acceleration of information, technical knowledge and mobility. Yet the share of human assets enjoyed by rural people, the poor, and above all poor rural girls and women, is arbitrarily low (and has not been rising globally), though their private and social return on such assets is high. Especially where the rural poor are a large proportion of the

population, that is inefficient, as well as unjust – ever more so as the relative role of human assets increases. Policy must focus on human asset acquisition for rural poor people, especially women and girls; otherwise their disadvantage will become increasingly stubborn.

Human assets are conventionally classified as nutritional status, health and education, but their nature is changing radically. Education increasingly involves lifetime skill acquisition for management and for acquiring and processing information, in a context of more rapid and frequent changes of work and residence. Health and nutrition needs are being transformed alongside demographics (especially age-structure), work, and medical threats, knowledge and technology.

Human assets have intrinsic value in raising capabilities and/or happiness, and instrumental value in raising income – and thus access to further capabilities and happiness. These values can be realized directly, by applying improved skill or health to initial leisure, labour and natural and physical assets; and indirectly, by using improved health, education and nutrition to control more assets that raise consumption, leisure or earned income: to obtain information and to implement choices, especially through mobility.

Most extra instrumental benefit from human assets depends on combining them with extra natural or physical assets (land, a workshop) or with new or better work. Skills and good health raise income by increasing productivity of labour and/or natural or physical capital, and hence encouraging people (or their employers) to use more of them. Extra human assets and other inputs are complements. Conversely, the poverty impact of skills and health is less if there are few profitable outlets for labour or for physical or natural capital. In rural Pakistan the extra income obtainable from education is substantial in the green-revolutionary province of Punjab, but small and unattractive in the more sluggish rural Sind.⁹⁵

In Eastern and Southern Africa, 'as long as small-holder agriculture remains the principal economic activity of the rural poor' – although better health and education retain intrinsic value – their instrumental 'impact . . . will be limited until the major institutional and resource constraints facing small-holder producers are reduced'.⁹⁶ Income gains, often attributed to better rural nutrition, health and education, are seldom achievable unless it pays those who acquire them to obtain more, or more productive, complementary work or natural or physical assets.

Educational provision and outcomes have been improving globally, though unevenly; so had nutrition outside Africa, and also health provision and outcomes, until the terrible reversals of the 1990s due to AIDS, tuberculosis and malaria. But the rural and the poor remain far behind and the gaps have not narrowed: the rural poor still have worse health, education and nutrition outcomes and worse provision than others. So for the rural poor, a little extra – a dozen more clinics, a hundred calories a day, an extra year of adequate schooling – enhances welfare, capabilities and income more than for urban or rich people. Further, that little extra normally costs less: since the rural poor, especially the remote and minorities, have least provision, educational and health options with high returns are most likely to have been overlooked; an extra year of education, for example, is likely to mean costly tertiary education for the richest urban children, but primary education for the rural poorest.

Human capital assets of the rural poor

Access to educational assets differs sharply between rich and poor, and between urban and rural people; since the rich can seek out urban schools, rich-poor differences are greatest in rural areas.

Rich and poor. In Bangladesh, Pakistan, Malawi, Mozambique and Egypt the richest income quin-

tile enjoyed, on average, twice as many years of education as the poorest, in addition to huge quality advantages. Moreover, the spread of school access (by region, gender, and so on) is much bigger among the poor. It follows that the median poor child is particularly disadvantaged educationally compared with the median rich child, above all in the poorest developing countries. In the 1990s in India, the median 15-19-year-old from the best-off quintile of households had completed school grade 10; but the equivalent person from the poorest two quintiles had zero schooling.⁹⁷ In Indonesia the respective grades were 9 and 6. Education greatly reduces risk of subsequent chronic poverty in rural China and rural and urban Egypt; chronic and transitory poverty in rural Pakistan; and total poverty in rural and urban South Africa.

Rural and urban. There is no overall evidence of a fall in the huge rural-urban differences, identified in the 1970s, in educational provision and access. As for outcomes, the latest reported rural and urban illiteracy rates were: China 26% and 12%; India, 55% and 27%; Egypt, 67% and 40%; Brazil, 31% and 11%. This is not just because rural households are poorer: in India in 1986-87 the literacy rate in the poorest quintile of urban households (50%) was above that of the second richest rural quintile (48%). Globally, these gaps have widened. The typical rural adult, surveyed in the 1960s or 1970s, had 1.4-2 times the urban adult illiteracy risk in the countries of North Africa and Asia; the ratio was 2-3.5 in Latin America.⁹⁸

On the health of the poor, poor people are less likely to report sick, because they expect to feel unwell, and anyway can seldom afford time off or health care. Objectively the poorest quintile have higher infant mortality rates where inequality is great and medical care mainly for those who pay. Recent infant mortality rates in the poorest (richest) quintile of households by consumption per equivalent adult were about 70 (25) per 1000 in

Brazil, 100 (40) in Nicaragua, 97 (52) in South Africa and 107 (62) in Côte d'Ivoire, but the gap was far smaller (though absolute rates were high) in Pakistan and Ghana. The disparities in child mortality rates were greater, for example 116 (11) in Brazil and 155 (71) in South Africa.⁹⁹

As for rural and urban health, in 12 developing countries, the ratio of rural to urban mortality from birth to age five rose from an average of 1.4 in the mid-1970s to 1.6 in the mid-1980s. As for the infant mortality rate (IMR), in most developing countries with good data, while both urban and rural IMRs were declining, the ratio of rural to urban risk was, until the late 1980s, high and stable or widening. In India, from 1970-75 to 1981-85, the rural IMR fell by 19.5% (to 113) and the urban IMR by 28.1% (to 64), but by 1990 the rates were 86 and 51 respectively, so that in the 1980s rural IMR decline accelerated. In China, 'official' urban and rural IMRs in 1957-88 fell, respectively, from 50.8 to 13.9 and from 89.1 to 23.6, that is, at similar rates.¹⁰⁰

As for the nutritional rich-poor gap, a 10% rise in income is associated with a 1-4% rise in dietary energy intake in household surveys; the rise is higher among the poor,¹⁰¹ indicating that they, despite having the highest work-energy needs, are the most malnourished.

Rural-urban nutrition gaps are substantial and not narrowing. Though calorie intake per consumer unit does not differ much between rural and urban areas, rural people need more energy for work, travel, disease resistance and pregnancy, and have higher micronutrient deficiencies, impeding efficient energy utilization.

These different kinds of human capital deprivation reinforce each other's impact on the rural and the poor. Among children of illiterate mothers, mean weight-for-age in Bangladesh rises from 67% of the United States minimum acceptable National Centre for Health Statistics (NCHS) standard in the poorest quintile to 69% in the richest,

whereas with literate mothers the improvement is much more, from 65% to 75%. The interlocking disadvantages are passed on to the children of the rural, the poor, the unhealthy, the uneducated. The poor, and the rural among the poor, have higher child mortality, replacement fertility and thus child-to-worker and consumption-to-savings ratios. Uneducated women marry sooner, and have higher marital fertility. Their households are worse nourished, even at similar incomes, due to less knowledge of food and farming, higher worker/dependant ratios and more sibling competition. Where education is especially unequal (by region, gender or income group), malnutrition is higher than elsewhere, especially among small children (the most vulnerable), due to high fertility in uneducated households.¹⁰²

More severe inequality in educational attainment in countries of Latin America and Africa than those of Asia explains about half their higher overall inequality.¹⁰³ So higher rural-urban inequality of human assets in Africa, and intra-rural inequality in Latin America, account for much of the high poverty there.

Productivity and poverty impact of rural human capital for the rural poor

Public or NGO outlay to steer human capital assets to the rural and the poor is unjustified if the same outlay cuts poverty more when directed to other capital for the rural poor, or to human capital for the urban poor. Does schooling, sanitation or better nutrition, though bringing double the benefit when directed to the rural poor as to the urban non-poor, cost three times as much? Does it convey sufficient welfare, capabilities or productivity gains to the rural poor to justify the cost of steering it to them?

Education

Education is good at reducing poverty for rural people who can use it to get better work or income

from physical or natural capital, whether within farming or by leaving it; but it is much less so if they must stay where farm technology is sluggish. Where new technologies are rewarding, education speeds their adoption, often bringing large productivity and income gains for small farmers and farm workers. In Thailand four years' education triples the chance that a farmer will use new chemical fertilizers; educated farmers in India are more likely to use credit, irrigation and improved seeds. However, in Africa education appears to have a mixed and, where favourable, small impact on agricultural productivity. Education speeds adoption of new agricultural technologies and of cash crops, for example, in IFAD's efforts to help smallholders in Malawi to grow tobacco. Education can impart good farming practices in school; ease access to new information; facilitate access to others with information, like health professionals and extension agents; improve ability to make sense of new information; and so speed up innovation. This matters most during rapid change, as with the early Green Revolution in the Indian Punjab; then ability to master correctly new combinations of inputs and technologies can have high pay-offs.¹⁰⁴ But if there are few new opportunities, or if their benefits are confined to those with substantial fixed assets, education alone may do little to help the poor. Education raises the rural poor's income only to the extent that they also have, or get, natural or physical assets or work yielding more if one is educated – and prices, policies, technologies or events raise demand for the products of the more educated poor, or make it more price-elastic.

This need not mean that the rural poor in agriculturally sluggish or dryland areas gain little from education. First, some such areas may be coming to show the best prospects for agricultural expansion given appropriate research. Second, adult education, which for demographic reasons must receive increasing emphasis in anti-poverty policy,

can help the poor to organize and lobby to improve infrastructure, health care, production, or access to information and power; NGOs such as Bangladesh Rural Advancement Committee (BRAC) in Bangladesh, interacting with microcredit and adult literacy training, have played a major role (Box 3.11).¹⁰⁵ Third, while the poor, to gain income from education, need to combine their new capabilities with other assets, work or technologies, these need not be rural or agricultural. Historically, education has reduced rural poverty mainly by helping people with few prospects in farming to leave it, and to seize non-rural or non-farm opportunities.

Nutrition and health, children and the rural poor: a virtuous circle

Human health assets comprise bodily and mental characteristics promoting longevity with full functioning, and resistance to (or rapid recovery from) illness and injury. The rural poor are especially handicapped by acute illness and injury (often untreated) in earning, learning and quitting poverty; and by chronic illness and injury due to unfavourable health-work-home and especially water-sanitation environments; and by low nutritional assets, such as height and lean body mass.

Inadequate food substantially reduced productivity of rural workers in India and cane-cutters in Guatemala, where calorie (rather than protein) shortage was the cause. For rural labourers in Sri Lanka, wages rose by 0.21% for each 1% rise in calorie intake. Anaemia has been found to reduce productivity and iron supplementation to raise it.¹⁰⁶

Rural workers' incomes depend on the capacity to fight off illness, and on lifetime physical, learning and mental capacity and hence productivity when well. Both are much affected by child nutrition, including exposure to infections, mainly water-borne, that impede nutrient absorption. Caloric undernutrition and micronutrient shortage in childhood bring low height in adults. This reduces

Box 3.11: Regenerated Freirean Literacy through Empowering Community Techniques (REFLECT)

REFLECT was started by Action Aid in 1986; pilot programmes in Uganda, Bangladesh (for women in savings and credit programmes) and El Salvador (through a local NGO involved in land rights, credit and primary health care) were evaluated in 1995. Each group develops materials based on its appraisal of members' problems. By the end of the literacy course the group has a copy of the materials, and sufficient literacy to use them to plan development. Of members, 65% in El Salvador, 60% in Bangladesh and 68% in Uganda had basic literacy after a year (compared with 43%, 26% and 22% in control groups; but there is some self-selection). In El Salvador, 61% of participants had assumed formal positions of authority in community organizations (community council, credit committee, parent-teacher group); 80% attend meetings of community organizations; and 77% are involved in decision-making. Class discussions had led to:

- **Community action to improve local conditions:** cooperative buying or selling, regrading roads, school repairs, pipes, building latrines, etc.
- **Individual farm improvements:** terracing, organic fertilizer, tree planting, digging a tubewell (Bangladesh); in better crop spacing, grass planting on slopes to slow erosion, planting productive trees such as avocado, diversifying from rice into peak-spreading food-security crops, and building stores using local materials (Uganda, where 82% of group members said they had improved knowledge of agriculture); new crops and varieties, storage to get a better price, spacing crops for optimum productivity, bunding hillsides against erosion and analysing soils for crop suitability (El Salvador).
- **Household management:** in Bangladesh, women felt that use of calendars/matrices improved planning and coping strategies, such as bulk buying and storing; many have more control over loan use; 76% now felt able to negotiate with salesmen who had earlier exploited them. In Uganda, men started to do domestic work, collecting water and wood; health awareness has improved latrines and waste disposal.

This highlights the need to put rural adult education in context; the poor may otherwise see the opportunity cost of taking time off from work as greater than the value of the classes. Perhaps three birds can be killed with one stone: farmers get numerate and literate; learn to handle individual, household and community issues and, via structured information exchange, improve practice; and organize for village development. Unfortunately, there is no information about the proportion of attenders or non-attenders who were poor, or who escaped poverty.

Source: Archer and Cottingham 1996.

market wages for adult cane-cutters in the Philippines. For men of the same height and caloric intake, greater body mass brings higher wages, though height has more effect.¹⁰⁷ The nutrition-strength-productivity effects are much clearer, indeed there are thresholds,¹⁰⁸ for the smallest (and poorest) adults than for others, and for those likely to do heavy physical work: the rural ultra-poor. Undernutrition also harms learning, schooling, and hence later productivity,¹⁰⁹ again harming the rural poor most.¹¹⁰ Child ill-health and undernutrition are thus causes, not just effects, of rural income poverty. A virtuous circle emerges from targeting on the rural poorest outlays for better child nutrition: it brings better adult health, education and productivity, which further improve child nutrition.

Yet even among the poor, calorie intake seldom rises by more than 4% when income rises by 10%. Direct approaches may be needed, notably interventions that help the poor cope with fluctuations in food supply. The IFAD/UNICEF-backed Andhra Pradesh Tribal Development Project in India (1991-99), established 230 grain banks and community nutrition workshops; and IFAD's inputs to the Special Programme for Africa include improved village cereal storage in Chad, and education on nutrient-rich foods and improved preparation techniques in the Kwale and Kilifi District Development Project, Kenya. Targeted nutrition interventions¹¹¹ can also be highly productive for the rural poor; increasing emphasis is now placed on micronutrients.¹¹²

Health and the rural poor

In Côte d'Ivoire and Ghana, an additional day per month of disabling illness brings a decline of 10% in male wages and of 3% in labour supply.¹¹³ Nutrition-linked diseases (especially dysentery) remain the main affliction of the rural poor, but they are also exposed to other physical risks to their human assets. Agricultural workers' injuries from sickles, snakes and scorpions, and ill-health due to pesticides, are common and often untreated. So are burns from open fires and pollution from indoor cow-dung stoves. Investments in new types of fuel or stoves can help solve this problem, as with kerosene stoves in rural Nicaragua.

As for chronic illness, in parts of Africa and (though less recognized) Asia, HIV/AIDS not only kills many – life expectancy in several Southern African countries has regressed to levels not seen since the 1960s – but also condemns others to leave work in order to care for the sick and the orphaned. HIV/AIDS is a disease of poverty in that poverty pushes men into single-sex migration, women into prostitution, and children into undernutrition and hence impaired immune response. HIV/AIDS, though thought of as mainly urban, is spreading faster in some rural areas of India; in much of Africa urban and rural prevalence rates are similar. Rural areas along truck routes, or sources of migrant labour to towns, are especially vulnerable, as are nomadic pastoralists and farm women with seasonally migrant husbands. Yet in rural areas the infrastructure for prevention programmes (information; AIDS tests; counselling; condom availability) is less developed. So too are treatment facilities. Yet rural families bear the main burden of time and costs.¹¹⁴ The burden of chronic rural sickness is also swollen by the spread of drug-irresponsible malaria and tuberculosis. Urban populations, tending to return to the village when sick or old, intensify the problem.

Any strategy for rural poverty reduction must include shifting asset formation towards building

the health, education and nutrition of the rural poor, and away from concentration on tertiary urban health and education. But given resource scarcities, it is also essential to improve the efficiency and equity with which scarce resources for building rural human capital are used and maintained. Central issues include: reducing gender inequity in access to human capital assets; increasing user control over, and contribution to, providing such assets; and dealing with seasonality.

Human assets and the rural poor: addressing gender inequity and the new demographics

There are huge gaps between male and female educational access and literacy levels. These gaps are greater in rural areas, and greatest for the rural poor. Inequity helps cause inefficiency: female schooling does much more at the margin for income, poverty reduction, and child health and nutrition than extra male education. Women's lower adoption of agricultural innovations is due entirely to lower levels of education; at the same level, women farmers are as quick to adopt as men. Extra education raises household income more if it goes to females. Across Indian States in 1957-91, the responsiveness of poverty to initial female literacy was higher than to any other initial condition. Mothers' education is also associated with better child health in many studies, often holding income constant. Extra human capital for poor rural women and girls could well create a virtuous circle of better income, less poverty and better health and education, transmitted intergenerationally.¹¹⁵

This is underlined by the better impact of female income upon subsequent child nutrition and education and the rising proportion of rural people, and household heads, who are women. The growing age of the workforce means that a large, growing majority of the 2020 workforce is already well past its childhood. Human capital formation, for cost-effective impact on instrumental benefits (especially employment and labour productivity),

must concentrate much more upon adults. IFAD experience of rural female literacy programmes¹¹⁶ shows what can be done.

User fees and empowering the poor in health and education: helpful or perverse?

Decentralized user involvement in control over many public and NGO activities, despite the difficulty of ensuring that the poor have their say, improves participation, power, and often managerial efficiency. How does this apply to getting better human assets to the rural poor? It is not just poverty that makes so many of them work rather than attend a school or clinic, but, given the value of their working time, low school and clinic quality and their incapacity to improve it. Witness the contrast between rural school efficiency in South India and in Uttar Pradesh; in the latter case only, parents have little influence on teachers' performance or even attendance, with appalling results.¹¹⁷

In the 1980s user fees were widely thought to give consumers decentralized market power over health and education services, and to keep them going despite fiscal stringency. The effects of user fees on basic services for the rural poor have been, on balance, damaging. Without adequate exemption (targeting), user fees harm the poor; yet exemptions have proved very hard to manage cleanly and efficiently. Exemptions are absent in about one quarter of developing countries with user fees, and elsewhere seriously flawed by including the non-poor (such as health workers and the military) and excluding the rural poorest, or not reaching them in practice, as in Ghana and Zimbabwe.¹¹⁸ The poor are more likely to give up such a service when a fee is imposed or raised. Even if they do not, since they typically devote 70-80% of the value of consumption to food, they almost certainly cut their own, or their children's, already inadequate nutrition to pay school or clinic fees.

Often user fees mean that treatment is delayed. In Zimbabwe, after the 1991 introduction of fees, the number of babies born premature increased by 10%. In four rural districts in Viet Nam, where fee exemption for the poor was ineffective, people delayed treatment and made less use of government health facilities (and the rich spent 3.9% of household income on health, compared with 19.3% for the very poor). In rural Kenya in 1989-90, curative out-patient attendance fell by over 30% after fees were introduced, and in-patient days by 20%. The poor reduced their use of health services most, as in rural Swaziland.¹¹⁹

Similar findings apply to primary education:¹²⁰ higher response by the rural than the urban, and by the poor than by the non-poor, to user fees. This led to declining school attendance in Zimbabwe, Malawi and Kenya, where nearly half the households in seven poor districts had at least one child who had dropped out due to inability to pay fees. In Ghana, Zimbabwe and Kenya, girls were more likely to be pulled out of school than boys, which is especially worrying given the higher private and social returns to their education.¹²¹

Efficiency and equity effects apart, the revenue-generating potential of fees is small, and exemption of the poor is difficult.¹²² Credit is seldom feasible, let alone affordable, for school or health fees for the rural poor. As for insurance, middle-income countries with fairly dense and accountable public-service networks can operate with entitlement or exemption cards such as Chile's 'ficha CAS',¹²³ but elsewhere insurance cards such as Burundi's *Carte d'assurance maladie* (CAM) have had serious problems; in the mainly rural Mayinga province they recruited only 23% of households, largely self-selected and higher-risk, making self-financing infeasible and risk-sharing difficult.¹²⁴

The free provision, from China through Sri Lanka to Costa Rica, of much basic health and education; the sharp improvements in life expectancy and quality, and in poverty reduction,

so generated; the disappointing revenues from user fees; the difficulties of exemption and insurance; above all the impact on the poor, the rural, and women, all suggest that fees should not be applied to basic services in low-income countries.¹²⁵ However, it makes sense to self-target or indicator-target some services on those at risk, such as nutrition supplements for children with faltering growth.¹²⁶ And the slack-season or spare-time work of rural communities, even the poorest, can be used to maintain, improve, or even construct, rural clinics or schools.¹²⁷

CONCLUSIONS AND POLICY IMPLICATIONS

What makes an asset pro-poor? Typically, labour-intensity; capacity to build marketable skills; equal access for women and minorities; low seasonal and annual variation and risk; and focus on producing items that loom large in poor people's budgets, such as staple foods. Small and divisible assets are easier for the poor to acquire and manage. Fortunately, for important forms of rural asset, above all farmland, small scale brings advantages, such as low labour supervision cost and hands-on family-level overview. The persistently large share of farmland in smallholdings, and its labour-intensity combined with low unit costs in most branches of farming, provide strong arguments for (a) stimulating smaller and more equal landholdings, (b) steering more assets, especially education and water-yielding equipment, to rural areas, and (c) tackling the high risk and inadequate female access that limit the poor's gains from many rural assets.

Within rural areas, some countries such as China suffer from asset poverty mainly due to regional inequality; some, such as South Africa and Brazil, mainly due to land inequality within regions; and others, such as Ethiopia and Bangladesh, mainly due to low average per-person assets and GDP. But for many assets, notably human capital, rural-urban maldistribution is in many countries a main cause of asset poverty,

largely because governments and donors overlook rural and agricultural issues. In changing that, three main sorts of asset are most relevant to rural poverty reduction: farmland, water-yielding assets, and human capital.

Farmland

Over two thirds of the income of the rural poor is from farming. Most of the rest depends for growth on linkages to farming. Most of the rural poor still control some farmland; although the proportion mainly dependent on hired labour is rising, they too gain if land control is more equal and thus more labour-intensive. Land deprivation is strongly linked to poverty and vulnerability, and brings powerlessness, especially for ethnic minorities long compressed into remote and marginal lands.

Land redistribution to more equal family holdings has been massive, and has massively cut poverty. In much of Latin America and Eastern and Southern Africa, great land inequality still turns middle-income rural averages into widespread rural poverty, while probably reducing efficiency and growth. In most transitional economies much land remains in big state and collective farms; this harms the poor by being inefficient as well as reducing employment.

Yet classical land redistribution has slowed since the mid-1980s, partly because it was often unduly statist, centralized, slow to distribute land to the poor, insufficiently concerned with competitive inputs and services for new smallholders, and liable to create uncertain property rights. There is now a shift towards decentralized, substantially compensatory and market-led reform. Policy can help by removing selective subsidies to large farmers and their inputs, raising their incentive to sell land to the poor, and by direct donor support to appropriate land redistribution. Former large farmers can often profitably provide financial, marketing or processing services competitively to post-reform smallholders.

Given the distribution of land, the poor usually lose from laws against voluntary tenancy or communal tenure systems. Modes of formal and informal titling, tenure and tenancy are usually efficient forms of avoiding highly local transaction costs, provided the poor are not exposed to the market power of a few large landlords.

Neither unreformed nor reformed systems usually give women equal access to land. This is unjust, inefficient and bad for the health and education of children. Priorities in land reform should be: land for women; regions where extreme land inequality is the main constraint on poverty reduction; support services for post-reform smallholders; and incentives to sustainable post-reform farming systems.

Water-yielding assets

Increasing water scarcity coincides with big farm water subsidies: hence the pressure to divert water from farming. Yet the poverty-reducing Green Revolution was largely confined to water-controlled lands. The poor share even less in farm water than in farmland, and suffer serious drinking-water shortages. While persistent subsidy is wrong (and anti-poor), and while rural water-yielding assets should be redistributed and the economic efficiency of rural water use improved, unselective water transfer to urban areas would worsen rural poverty and pressure on marginal drylands.

Small farmer-controlled water-yielding assets irrigate large areas and are often pro-poor, but are not the whole answer. With large water-yielding assets, the non-poor often get special access, exacerbated for women by intra-household problems. Yet some projects have overcome such difficulties. Even if much asset management is centralized, water markets and full-cost pricing can assist access, instead, to the water itself.

Water-yielding assets can be redistributed to the poor by (a) restricting overpumping; (b) responding to poor user needs, for example, by supporting

water harvesting; (c) credit, technical help or hydrological data to help the poor invest in wells; (d) facilitating private rent or sale of water-yielding assets to the poor; (e) substitution of employment for water in irrigation management and maintenance; (f) water user associations, representing the poor, to help control and manage systems; and (g) removing water subsidies, safeguarding the poor by allowing user groups to pay by maintenance work.

Drinking-water priorities reflect overwhelmingly urban interests, yet rural water deficiency is greater and harms health more. Cleaner water is more cost-effective in improving rural health and productivity if it complements other inputs; avoids technology dependent on unreliable external fuel, spares and maintenance; and trains and pays community maintainers. Finally, in some countries the rural poor's share of controlled water for production and clean drinking water is so tiny that substantial, open redistribution from urban and rich rural people is inescapable.

Human assets

Better health, education and nutrition help the escape from rural poverty by raising, first, innovativeness, income and food production of farmers and workers in low-income areas; and second, mobility to (and earning capacity from) cash-crops, rural non-farm production and urban work. In these roles human assets complement others: if the economy, physical capital, technology and employment stagnate, extra human assets for the poor may simply shift income among them. Moreover, while education, health and nutrition assets in developing countries have been improving unevenly and often slowly, the huge rich-poor and urban-rural disparities have mostly stagnated or widened. Shifts of human-asset-improving outlays to the rural poor, especially women, usually raise cost-effectiveness, partly because of mutual reinforcement among better

health, nutrition and learning, and smaller families, less poverty, and higher productivity.

Women's education disadvantage, greatest for the rural poor, explains low female innovation. If corrected, it cost-effectively improves child health, education and nutrition. The rising proportion of women farmers increases these prospects. Nutrition improvement raises subsequent learning, productivity and wage-rates, and cuts risk of income loss due to illness: it does most for the worst-off. The rural poor's gains from extra health can depend on complementary nutrition and schooling. The demographic transition, by sharply raising the proportion of workers 30 years hence who are aged over 15 now, implies productivity gains from shifting education and health assets towards poor adults.

Decentralized responsibility for asset formation in health, education and nutrition increases returns to the poor. But user fees for primary and preventive services in low-income countries have proved counter-productive. Exempting the poorest is seldom feasible; children suffer if they are denied basic human assets.

OTHER ASSETS

Other assets matter for rural poverty reduction: but they cannot replace policy to increase farmland, water and human assets of the rural poor, sometimes by redistribution.

Rural non-farm assets and work are large, growing parts of rural activity, but often mainly for the non-poor. Distress diversification from stagnant farming into languishing crafts seldom helps the poor. Growth linkages to dynamic sectors often do, but usually depend on prior, shared farm growth.

Livestock, especially small stock, can be crucial to the income, if seldom the diet, of many rural poor. The poor need institutions to acquire, manage and trade livestock and their products, and to help avoid crises in animal feed. Cattle ownership

is often heavily skewed against the poor and women. Poverty reduction is advanced by refocusing livestock public-goods provision on small stock; by reducing artificial barriers to large stock ownership by the poor; and by furthering the practices by which the poor control and manage livestock they do not own.

Housing assets of the rural poor are often even worse than for the urban poor, yet almost all habitat policy is urban. The rural poor's houses need frequent repair. Traditional materials are getting scarcer, and need research on better durability and access. Public works can include off-season work in small local firms to test new house designs. Redistribution and service support for rural site-and-service and home gardens may also be feasible.

Transport and communications assets are often unsuitable for private or joint producer control by the poor. But the poor's weak access as consumers and producers carries huge handicaps and costs, both in market access and, especially for women, in domestic and inter-village farm, fuel and water transport. Non-motorized vehicles can greatly cut such costs, and are easily maintained.

The rural poor want assets to raise income and to provide buffers against shocks. The poor are more likely to control some sorts of assets than others; but farmland, water-yielding assets, and human assets are especially crucial. Pro-poor policy should be directed at improving access to and returns from assets. For land and water this may require redistribution; access to livestock, human capital and non-farm activities require mainly greater opportunity. Gender inequality in access to assets needs to be addressed in policy, and monitored. Rural people in most developing countries enjoy less, per head, of most sorts of assets allocable between city and countryside, especially human capital; these gaps, which in general are not falling, are inefficient as well as inequitable.

Annex 3.1

Non-distributive land options: collective, state and cooperative farms, titling communal land, tenancy restrictions

State, collective and cooperative farming

Attempts to compel cooperative asset use are self-defeating,¹²⁸ and cooperative use of farmland is seldom economic or preferred. However, there is scope for state or NGO help to rural people in cooperative management of assets (with scale economies) in use on farmland, especially where it is only managerial costs (including the costs of trust) that stop farmers from choosing cooperative institutions.¹²⁹ Such help for cooperative farm savings for joint irrigation in the Mexican *ejido* proved useful to the poor. Similarly some 60 000 of the 300 000-odd egalitarian family farmers, created out of the Armenian decollectivization in the early 1990s, chose to work through optional (but misnamed) 'collected farms', mainly for asset purchase, leasing arrangements, farm management advice and the consolidation and exchange of fragments. Though the poorest may be better reached if such cooperation is supported among landless suppliers of the input (for example, water from IFAD-supported Proshika groups in Bangladesh), state assistance to farmers can be helpful in bearing the managerial costs and externalities of otherwise desired joint activity. However, outside enforcement of joint (or state) farm activity not desired by the farmers is not land reform, but land 'deform'. It harms the rural poor.¹³⁰

Communal tenure and titling

This is also true of enforcement of individual private property, if it runs against the grain of economics and of farmers' wishes. Where low-grade land is fairly plentiful and fencing expensive, common grazing rights have evolved, and cropland – while almost always farmed individually with private usufruct rights – is owned communally. Rights to sell, rent or bequeath such land are highly variable and adapted to local situations, but often limited or absent.¹³¹ Advocates of private titling argue that communal tenure impedes farmers' borrowing, because land is not acceptable as collateral; induces them to 'soil-mine'

and degrade land¹³² (since in future years it may not be theirs to farm),¹³³ and diffuses and weakens demand for innovations.¹³⁴ However, in practice, communal tenure does not reduce production or efficiency, or even impede borrowing, as compared with freehold, in most conditions in Africa. Communal tenure is unlikely to reduce investment incentives, due to low risk of eviction.¹³⁵

The balance between individual and communal tenure rights, unlike the distribution of power and control over scarce land, is mainly an effect, not a cause, of the prospects for profitable agricultural innovation, borrowing and conservation.¹³⁶ Private landholding normally develops in response to greater land scarcity,¹³⁷ new technical prospects, or different sorts of gain from conservation. But the adjustment involves conflicts of interest, transaction costs, and hence friction and delay,¹³⁸ which can justify public action to support land titling where most of the poor want it. But there is no case for enforced decommunalization or titling. This can disadvantage women, tribals with unwritten tenure records, and other vulnerable groups, without enhancing efficiency, as in Uganda.¹³⁹ In Rajasthan, India, Jodha¹⁴⁰ shows that privatization of common grazing lands was less favourable to the poor than use of the commons had been before titling, so that the process cost the poor substantial parts of income. Shanmugarathnam¹⁴¹ shows that privatizing and titling reforms on grazing land disadvantaged pastoralists with small ruminants, mainly the poor.

There are exceptions. Titling can benefit the poor through improving the security of smaller, less well-documented holdings, since 'it is the holdings of [small farmers] that are especially likely to be untitled'. Where much land starts in the public domain, titling, as in Honduras, can help ensure that poor, not only rich, purchasers get security.¹⁴² Where landlords are shifting tenants around, to stop them establishing the right to buy land under tenancy regulations, registration of title – as in West Bengal's 'Operation Barga'¹⁴³ – is a useful adjunct to land reform. But caution is needed. The above examples of titling that increases poor people's shares in land do not mainly come from areas of traditional communal tenure. There, the search for titling usually comes from better-off

farmers and may offer more advantage to large ... farmers who have better access to markets'.¹⁴⁴ In communal areas, imposed removal of restraints on land sale can harm the poor, without efficiency gains. Unlike land-lease markets, land-sale markets, especially in progressive farm areas, tend on balance to transfer assets from poor to non-poor.¹⁴⁵ Higher farm efficiency does often require transfer of farming to better, nearer, or differently resourced farmers; but this can often be achieved by an emerging lease market, even without titling.

Control of land may best be redistributed not as ownership or title, but as common village or regional tenure – with secure individual usufruct rights. In China, this was linked to big increases in output and productivity. In Niger, land tenure insecurity is associated with reduced application of manure and hence lower output. In Ghana, density of tree planting is positively associated with tenure security, but not necessarily ownership.¹⁴⁶

Tenancy and tenancy reform

The extent, type (sharecropping or fixed-rent) and terms of tenancy such as collective, private and communal operation and tenure, are mainly consequences of agro-economic opportunity and incentives, and the initial distribution of control and power over land. If these causes do not change in the poor's favour, laws to restrict the type, extent or terms of tenancy seldom help the poor. Indeed, they are often counter-productive, inducing landlords to resume tenanted land for personal farming – usually larger-scale, more mechanized and less employment-intensive.¹⁴⁷

Tenancy generally transfers farmland to smaller holdings.¹⁴⁸ In India, 'tenancy reallocates land from the large and middle farmers to the marginal farmers', leading 'to greater utilisation of land and labour';¹⁴⁹ in the mid-1980s some 79% of rural households leased in land, of which over 90% owned no land or below 1 ha – and more such households would lease land if legal restrictions were eased.¹⁵⁰ This flow of rented land to the poor is confirmed in a dis-

trict study.¹⁵¹ Such flows allow poor households to sell and improve their managerial skills; to obtain income from land control; to save money to buy land later;¹⁵² and to adjust their labour inputs, normally upwards, to suit their preferences. Also, rented holdings, being usually smaller, typically hire more labour per hectare than owned holdings. Efficiency losses due to type of tenure – for example, sharecropping – are usually prevented by explicit or implicit landlord-tenant deals. Usually, pro-poor agrarian policy should encourage tenancy (while creating an environment of greater equality in land access and political rights), not, as in the past, discourage it or restrict¹⁵³ its types or terms. The fact that barely 5% of farmland in Latin America is tenanted¹⁵⁴ indicates overemphasis on restricting or regulating tenancies, instead of on implementing or obtaining consensus for land redistribution.

Tenancy laws and restrictions, for example, to improve sharecroppers' terms, can help the poor, but only where power shifts sufficiently in favour of the poor to render credible the enforcement of ownership ceilings upon landlords who respond by eviction and resumption of large farms for personal cultivation. Land reform in Japan, the Republic of Korea, Taiwan and West Bengal consisted largely of tenancy restrictions, especially on sharecropping, yet greatly advanced equity and efficiency because it accompanied already widely dispersed land ownership and the reality or threat of effective implementation of ceilings legislation, so landlords could not resume large areas of land for personal cultivation. Further, the rural poor had already acquired considerable power. Operation Barga in West Bengal, India, after 1977 secured small tenancies and thus caused rapid growth in agricultural activity in the early 1980s.¹⁵⁵ Similarly, laws that set ceilings on rentals (especially for sharecropping) or on rented land, or entitle the tillers to buy it, usually cause evictions; but in Taiwan in 1949-53 such laws durably redistributed farmland to the poor, because evictions were prevented by credible ceilings for owned land.

Table 3.1: Gini Land Concentration Index

Country	1941-1950	1951-1960	1961-1970	1971-1980	1981-1990	1991-2000
Algeria				0.72s		
American Samoa	0.5716	0.7963	0.75		0.6705	
Antigua			0.7351			
Argentina		0.8625	0.873w		0.8598	
		0.836				
Australia	0.8391	0.8321		0.8206	0.9032	
Austria		0.7100	0.6953	0.6773	0.6581	
Bahamas				0.8956		0.8722
Bangladesh		0.47;	0.57	0.4187	0.549e	
		0.61		0.54		
Barbados			0.8996		0.9284	
Belgium	0.489	0.6137	0.5942	0.5668	0.5639	
Belize				0.7079		
Bolivia					0.7677	
Botswana						0.4369
Brazil	0.8329	0.8347	0.837	0.8521		
Brunei			0.5103			
Canada		0.534	0.5449	0.5119(71)		0.5531
				0.6016(80)		
Chile		0.933				
China				0.211	0.190	
Colombia		0.8598		0.8592	0.7742	
Cook Islands					0.4866	
Costa Rica	0.8072	0.782	0.7913	0.8133		
Cuba			0.35	0.21		
Cyprus				0.6061	0.6339	
Czechoslovakia	0.6772		0.9384		0.9195	
Denmark	0.4574	0.4513	0.4403	0.3961	0.4299	
Dominican Rep	0.7962	0.7999	0.79	0.8197		
Dominica			0.7957			
Ecuador		0.8642		0.8155		
Egypt	0.7144	0.6283		0.4587		
El Salvador	0.8309		0.8386	0.8075		
				0.61s(71)		
Ethiopia				0.4379	0.4701	
Fiji			0.5875	0.8508		0.7336
Finland	0.5984	0.5007		0.4388		
France			0.5165	0.5772(79)	0.5821	
				0.5256(80)		
Germany	0.6748	0.5391		0.5136	0.5142(87))	
					0.6674(90)	
Greece	0.4741			0.4835(71)	0.4621	
				0.3974(80)		
Grenada			0.7808		0.7356	
Guadeloupe					0.6009	
Guatemala	0.8588	0.828		0.8484		
Guinea					0.5099	
Guyana					0.6783	
Honduras		0.7512		0.7788		
Hungary	0.5636			0.9797		

(cont'd)

Gini Land Concentration Index (cont'd)

Country	1941-1950	1951-1960	1961-1970	1971-1980	1981-1990	1991-2000
India		0.6781(54) 0.5829(60) 0.607w(60)	0.59 0.64e(70)	0.6144	0.5924	
Indonesia			0.5535 0.627(63)	0.5559 0.53s(73)		
Iran		0.623				
Iraq		0.7934(52) 0.8829(58) 0.902(58)		0.614		
Ireland	0.5702	0.5943			0.394	0.4659
Israel	0.8461			0.7549		
Italy			0.7452	0.7622	0.7386	
Ivory Coast				0.4229		
Jamaica			0.7909	0.8059		
Japan	0.3904	0.4114	0.4238	0.5212	0.3821	
Jordan			0.6671	0.6858	0.690	
Kenya		0.8184 0.822		0.6841(74) 0.7459(80) 0.81(77)	0.770e	
Korea			0.3535(61) 0.3108(70) 0.7635	0.3512		
Kuwait						
Lebanon		0.6862				
Lesotho		0.3738	0.362			
Liberia				0.7381		
Luxemburg	0.481		0.2905	0.4706		0.5013
Libya		0.6861				
Madagascar				0.804	0.800	
Malaysia		0.7507		0.5826		
Mali		0.4776				
Malta	0.352	0.4093	0.493	0.4733		
Martinique					0.7844	
Mauritania					0.5858	
Mexico	0.5915	0.6216	0.747			
Morocco		0.640	0.642			
Myanmar						0.4403
New Zealand	0.786	0.7159		0.7484(72) 0.7930(80)		
Nepal			0.57		0.6456	0.5181
Netherlands	0.546	0.5496	0.4787	0.699e	0.5024	
Nicaragua		0.8009		0.3177		
North Borneo		0.6442				
Northern Mariana					0.8235	
Norway	0.4131	0.3833	0.2959	0.4801		
Pakistan		0.5956 0.631 0.687w 0.61s(60)	0.63e	0.5363(80) 0.5081(72)	0.5835	
Panama	0.7129	0.7326		0.7778(71) 0.8441(80)	0.8712 0.840(81)	

(cont'd)

Gini Land Concentration Index (cont'd)

Country	1941-1950	1951-1960	1961-1970	1971-1980	1981-1990	1991-2000
Paraguay		0.8583 0.938		0.9281	0.939	0.7843
Peru		0.935	0.9355	0.9105 0.766(72)		
Philippines	0.5063	0.5076 0.580w		0.5093(71) 0.61s(80)		
Poland		0.5301	0.4638			
Port. Guinea		0.3971				
Portugal	0.7133			0.716	0.7249	
Puerto Rico	0.7253	0.7603	0.7749	0.7762	0.7569	
Reunion						
Saudi Arabia				0.9	0.8262	
Senegal		0.4927				
Seychelles		0.9246		0.8206		
Sierra Leone			0.4432		0.4774	
South Africa		0.701				
South Korea	0.729	0.195 0.30s	0.384	0.301		
Spain		0.8368		0.8459	0.8583	
Sri Lanka		0.665		0.6670(73) 0.6398(80) 0.51e(73)	0.619e	
Sudan			0.5765			
Suriname		0.7289	0.6935			
Swaziland						0.3032
Sweden		0.7568	0.5082	0.2275(71) 0.5092(80)		
Switzerland				0.5159	0.4843	
Taiwan		0.4500	0.4678			
Tanzania				0.7899		
Thailand		0.455	0.4585	0.452	0.366	
Togo			0.4792(61) 0.5244(70) 0.41(70)	0.4673		
Trinidad			0.6838			
Tunisia		0.6456				
Turkey		0.6027	0.611w	0.5779		0.5984
U.K.	0.7206	0.7166	0.6939	0.6754	0.6214	
U.S.A.	0.7035	0.7132	0.7165	0.7455	0.7536	
Uganda		0.5079 0.485			0.5896	
Uruguay		0.82	0.8147	0.8034	0.84	
Venezuela		0.927	0.9244	0.9096		
Vietnam		0.5823				
Virgin Islands		0.8515	0.5863		0.8786	
Yemen					0.6648	
Yugoslavia		0.6203(51) 0.5181(60)	0.5641			
Zaire			0.5915			

Sources: el-Ghonemy (1990) unless otherwise stated. Where any confusion is possible data from el-Ghonemy (1990) are suffixed e.
Data in the 1960 column are from Berry and Cline (1979: p38-9) unless otherwise stated. Data suffixed w are from Berry and Cline
(1979: p41-2). Data suffixed s are from Arupragasam (1990: p13)

Endnotes

- 1 This chapter excludes financial institutions – a source of borrowing for asset acquisition and a major focus of IFAD's work – because the poor do not borrow mainly to acquire assets. Likewise, it excludes 'social capital', i.e. institutions to increase and safeguard trust in social and economic transactions, since, however crucial to development, it differs radically from other assets. Both are dealt with in Chapter 6.
- 2 This is related to selection bias. Suppose some poor people, who obtain animals under a loan/subsidy scheme, escape poverty faster than others who do not participate. Such loans can be said to reduce poverty only if we allow for the initial endowments (skills, water access, etc.) of participants in the scheme, as compared with non-participants. Households selected to own livestock, or self-selecting to acquire it, tend to have initial endowments that render them relatively 'good at managing it. If we do not allow for such selection bias, we overstate the poverty-reducing impact of assets and misjudge the balance of advantage among asset types (Morduch 1999; Haddad *et al.* 2000a; see also World Bank 2000a).
- 3 Pathak *et al.* 1977.
- 4 Allowing for rich households' smaller size (Sarvekshana 1979). Distribution in India has hardly changed since (Jha 1999), and is less unequal than in most developing countries (Deininger and Squire 1996).
- 5 World Bank: database on Demographic and Health Surveys.
- 6 Eastwood and Lipton 2000.
- 7 Kanbur and Lustig 1999; Birdsall *et al.* 1995; Deininger and Squire 1996; Tyler *et al.* 1993.
- 8 Demand for farm labour grows fastest when agricultural land, and growth, are based on fairly equal small farms. Large farms have much lower labour/land ratios, and are more likely to grow capital-intensively (Binswanger *et al.* 1995; Lipton 1983b). Demand for rural non-farm products and labour grows fastest when local agriculture – above all, small-scale farming – grows rapidly, raising local demand for farm tools, farm processing, and especially consumer services like construction, trade and transport (Bell *et al.* 1982; Mellor 1976; Hazell and Roell 1983; Hazell and Ramasamy 1991; Fisher *et al.* 1997; Mecharla 2000).
- 9 The developing world's share of total population mainly dependent on agriculture was 58% in 1990 and is projected to fall to 47% in 2010. By regions, respective data are: South Asia 60 (50); sub-Saharan Africa 69 (58); East and South-East Asia (including China) 51 (40); and Latin America and the Caribbean 26 (17) (FAOSTAT 1998).
- 10 Reardon *et al.* 2000.
- 11 Singh 1985.
- 12 Binswanger *et al.* 1995.
- 13 Hazell and Ramasamy 1991.
- 14 Singh 1990.
- 15 Psacharopoulos and Patrinos 1993.
- 16 Haddad *et al.* 2000, and World Bank 1998a, b; Dercon and Krishnan, 1999; Scott 1999; Jalan and Ravallion 1999; Knight and Song 2000; Grootaert *et al.* 1997; Bevan *et al.* 1989; Galha and Deotalikar 1993; Lanjouw and Stern 1991; Bouis and Haddad 1990; Gunning *et al.*, 1999.
- 17 Carter 2000.
- 18 Kanbur and Lustig 1999.
- 19 Mitra 1978.
- 20 Sen 1981.
- 21 Taiwan: Mao and Schive 1995; India: Besley and Burgess 1998; Zimbabwe: Gunning *et al.* 1999; Kerala: Herring 1983.
- 22 For references to these four points see, respectively, (1) Julka and Sharma 1989; (2) Bhalla and Roy 1988, Oberai 1988, and Lipton 1985; (3) Lipton, 1985: 9 and references, Christiansen 1999, Lipton and Ravallion 1995, and Ellis 1998; and (4) Agarwal 1994.
- 23 Bell 1990; Thiesenhuessen 1989; Lipton 1983b.
- 24 India: Saxena 1990: 116-7, 124-6; Pakistan: Singh 1990. On *Sim Terra*, the recent Brazilian civil-society analogue to India's *Bhoodan* reform movement: Liamzon 2000.
- 25 Vyas 1976; Yugandhar and Iyer 1993; Manor 1989: 7.18.
- 26 Sources for paragraph: Ray 1996; Mearns 1999; Singh 1990: 66; Sanyal 1976; Haddad *et al.* 2000. Measured increases in land equality omit the landless; in India the proportions of rural people who own no land, who neither own nor operate land, and even – in some agriculturally stagnant states – who operate no land, fell between 1960-1 and 1970-1 (Singh 1990: 72-3).
- 27 Malawi: Sahn and Alderman 1988; Kenya: Hunt 1984.
- 28 Lieten 1996.
- 29 Besley and Burgess 1998.
- 30 Tyler *et al.* 1993.
- 31 FAO 1991; Deininger 1999.
- 32 Carter and Mesbah 1993: 1.
- 33 Deininger and Binswanger 1999; Guinnane and Miller 1997; Brooks and Lerman 1994; Nicaragua: Jonakin 1996; IFAD projects: IFAD 1992a, 1999f, and 1999h.
- 34 Deininger 1999; cf. IFAD 1999g; Haddad *et al.* 2000.
- 35 Tendler 1991.
- 36 Tendler 1991; Liamzon 2000: 14.
- 37 Agarwal 1994. As the proportion of old persons grows (even in poor populations with weak social safety-nets), this becomes more important for poverty reduction.

- because of women's greater survival prospects into old age. On the parlous state of widow-headed households in India, see Drèze and Srinivasan 1995.
- 38 For evidence on these three points, see respectively Alderman *et al.* 1995; Haddad *et al.* 1997; and Kennedy and Peters 1992.
 - 39 Latin American title: Deere 1987; empowerment (and Bihar): Agarwal 1994; exit and marriage: Sen 1990; Mwea: Hanger and Moris 1973.
 - 40 Agarwal 1998a.
 - 41 For evidence see, respectively, Ncube *et al.* 1997; Rose 1998; Deere 1987, on Latin America; Gupta 1993; Agarwal 1994.
 - 42 Agarwal 1994.
 - 43 IFAD 1999c.
 - 44 World Water Council 2000.
 - 45 World Bank 1992: 47-9, 100; Rosegrant 1995; IFPRI 1997; Gleick 1999; IFAD, Communal Irrigation Development Project, Philippines 1982.
 - 46 Kurnia *et al.* 1999.
 - 47 Niger basin irrigation: Pearson *et al.* 1981; swamp development in Sierra Leone: Richards 1985.
 - 48 For evidence on this paragraph see Bhalla and Roy 1988; Narain and Roy 1980; Mollinga 1998; Wade 1975.
 - 49 Kenya: Adams *et al.* 1997; Burkina and Ecuador: Zwarteveen 1997; The Gambia: von Braun *et al.* 1989b.
 - 50 Wood and Palmer-Jones 1991.
 - 51 India: Narain and Roy 1980; Latin America: www.cgiar.org/lrri/riceweb/g_overlatn.htm (CIAT 2000); the Philippines, and support for projects to improve farmers' water management: IFAD 1994a.
 - 52 For successes, see Ostrom 1990.
 - 53 Low maintenance is due partly to lack of incentives. Where many farmers share the same system, each has less incentive to maintain it than if one farmer is the sole owner/user. Water markets can give farmers an incentive to maintain the system. Alternatively, development of an institution responsible for water distribution and management can ensure maintenance.
 - 54 North India: Mellor and Moorti 1971, Pant 1984, Shankar 1981. Mexico: Levine *et al.* 1998; Bangladesh: Aeron-Thomas 1992.
 - 55 Howes 1980; Aeron-Thomas 1992; IFAD 1994b; Jain and Sarker 1994.
 - 56 IFAD 1999b: 43.
 - 57 Such as a given share per unit of irrigable land, or depending upon crop grown where farmers negotiate timing.
 - 58 Martorell 1995.
 - 59 Esrey *et al.* 1990.
 - 60 Nigeria: Huttly *et al.*, 1987, 1990; Blum *et al.* 1990; Imo State Evaluation Team 1989; Narangwal: Taylor *et al.* 1978.
 - 61 Increased quantity of water means that food may be prepared more often and that hygiene standards in the household may be improved through bathing, washing clothes, washing dishes and cleaning the house.
 - 62 Gleick 1999.
 - 63 IFAD 1999c.
 - 64 Churchill *et al.* 1987.
 - 65 VLOM: Reynolds, 1992; Morgan, 1993; IFAD, 1994c.
 - 66 UNICEF 1995.
 - 67 Sara and Katz 1997.
 - 68 Swajal: P. Iyer, pers. comm.; Tanzania: Cleaver and Kaare 1998, World Water Council 2000.
 - 69 IFAD experience suggests that most of Eastern and Southern Africa is an exception, though transhumant herders still loom large among the poor in Kenya and Botswana.
 - 70 Pingali *et al.* 1987.
 - 71 IFAD 1994a.
 - 72 In The Gambia, small stock are a store of wealth, used to buy grain or to 'save' and later exchange for cattle (Itty *et al.* 1997). For a Tanzanian case of cattle as a hedge against inflation and devaluation, see Gijnsman and Rusamsi 1991.
 - 73 Simmons 1981.
 - 74 Gittinger *et al.* 1990.
 - 75 Dercon 1998: 2, on Ethiopia.
 - 76 Average number of livestock: landless (2), marginal (<1ha = 4), small (1-2ha = 5), medium (2-4ha = 6), large (4+ha = 7).
 - 77 Botswana: Republic of Botswana 1975; Mongolia: Cooper 1995; India: Siroki and Siroki 1993, Farooqee and Nautiyal 1996, Sharma and Poleman 1994, Mellor pers. comm.; Pakistan: Kurosaki 1995.
 - 78 Delgado 1999.
 - 79 Poverty-focus of small stock: for Sukumaland, Tanzania, see Gijnsman and Rusamsi 1991; Dercon 1998; for Mongolian villages, Cooper 1995; for Madhya Pradesh, India, Siroki and Siroki 1993. Senegal: Itty *et al.* 1997; on costs of animal types, Seyoum 1992; on goats, Rao 1995.
 - 80 It was motivated partly by a misperception (Sidahmed 2000): that most common lands were overgrazed. Even if they were, ranching would not help; private ranchers, subsidized to improve their herds' condition and hence increase offspring, avoid overgrazing *their* ranches by shifting offspring back to the commons.
 - 81 Thomas-Slayter and Bhatt 1994.
 - 82 On India's RNFS, FAO 1998a, and Fisher *et al.* 1997;

- in Latin America, FAO 1998a; in Africa and overall, Reardon 1997.
- 83 China: Lin 1992; diversification versus linkages: Mellor 1976, Hazell and Ramasamy 1991; poverty-reducing prospects of modern vs traditional non-farm growth: Mecharla 2000 (on Andhra), Fisher *et al.* 1997, Bhalla 1994.
- 84 Binswanger *et al.* 1993.
- 85 Kingsbury pers. comm.
- 86 Hazell and Ramasamy 1991, Binswanger *et al.* 1993.
- 87 Hazell and Ramasamy 1991.
- 88 Lipton 1984.
- 89 Though some 2.5 million such homes are damaged annually by natural disaster, mud has benefits compared with modern materials, being cheap, nearby, ventilated, durable where there are few heavy rainstorms, and manageable with family (or local construction) skills (Mathur 1989; Satya Sundaram 1989).
- 90 Murthy 1989; Mathur 1989.
- 91 Herring 1983.
- 92 Dawson and Barwell 1993; Barwell 1996; Heldemann and Kaira 1984.
- 93 Barwell *et al.* 1985; Riverson and Carapetis 1991.
- 94 Microsoft's Bill Gates's massive support for research into malaria, Tuberculosis and AIDS was initiated by his realization, when visiting Soweto, South Africa, that these diseases and similar material constraints needed to be tackled locally, and that until this was done the 'communications revolution' was of limited relevance.
- 95 Alderman *et al.* 1996.
- 96 IFAD 1999a: 80.
- 97 The median 15-19 year old in the poorest quintile also had no schooling in Mali and Chad (top quintile, Grade 4), Benin (top quintile, Grade 5), Senegal, Niger, Côte d'Ivoire and Burkina Faso (6), Morocco and Bangladesh (8); and grade 1 or 2 only in Mozambique and Central African Republic (5), Malawi, Haiti, Comoros and NE Brazil (6), Madagascar (7) and Guatemala (9) (World Bank 1999a: 43).
- 98 On educational gaps: Asia, Osmani and Lipton 1997; rich-poor: Haddad *et al.* 2000, Fig. 5, Jalan and Ravallion 1999 (China), Haddad and Ahmed 1999 (Egypt), McCulloch and Baulch 1999 (Pakistan) and Maluccio *et al.* 1999b (South Africa). On rural-urban gaps: Lipton 1977; Drèze and Gazdar 1997: 81 (on India); Eastwood and Lipton 2000.
- 99 World Bank, 2000b.
- 100 On rural and urban health: Sastry 1997; on IMR: Rajan 1993: 112, Goyal 1994: 104. Outside estimates for China are higher, but not split into urban and rural (Bhalla 1995: 237). Africa shows a large, persisting anti-rural health bias. In Malawi rural child mortality declined from 360 to 261 in 1972-84; the urban rate, from 239 to 121 (Palamuleni 1994: 72). In Cameroon in 1962-76 the remote rural areas and the capital city showed the slowest IMR falls (Defo 1996: 411). In The Congo in 1985-92, a main predictor of child mortality risk - low birthweight - increased from 12% to 29% in rural areas, but from 12% to 16% in urban areas (World Bank 1997).
- 101 Alderman and Garcia 1993; Thomas 1986.
- 102 Haddad *et al.* 2000; Livi-Bacci and de Santis 1999.
- 103 Checchi 2000.
- 104 Lockheed *et al.* 1980; Chaudri 1973; Jamison and Lau 1982; Feder *et al.* 1985; Foster and Rosenzweig 1995; von Braun and Kennedy 1994; Thomas *et al.* 1991; Rosenzweig 1995; Huffman 1977; Schultz 1975, 1988. Peru: Cotlear 1990; India: Deolalikar 1988, Raza and Ramachandran 1990, Chaudri 1973; Thailand: World Bank 1991; Africa: Appleton and Balihuta 1996, Haddad *et al.* 2000; Malawi: Carletto 1999.
- 105 Liamzon 2000.
- 106 Basta *et al.* 1979; Sudhardjo 1986. India: Deolalikar 1988; Guatemala: Immink and Viteri, 1981; Sri Lanka: Sahn and Alderman 1988.
- 107 Haddad and Bouis 1991.
- 108 Payne and Lipton 1994.
- 109 Combining such costs of chronic deprivation due to child undernutrition with those of current undernutrition, Horton (1999) estimates forgone annual GDP from iron deficiency in childhood and from iodine and protein energy malnutrition in adults to be over 5% in Pakistan. For Bangladesh, the cost of iron deficiency in children alone is nearly 2% of GDP.
- 110 Neonatal undernutrition damages later cognitive function (Lucas *et al.* 1998); hence nutritional supplementation and stimulation of stunted children aged 9-24 months have independent and additive impacts on the development of the children aged 7-8 years (McGregor *et al.* 1997). At the mean of a nationally representative sample from Ghana, a 10% increase in stunting causes a 3.5% increase in age of first enrolment at school (Glewwe and Jacoby 1995).
- 111 Berg 1987.
- 112 Deficient Vitamin A, iron and iodine seriously damage the poor's human capital. Vitamin A deficiency is normally responsive to dietary diversification and hence to major poverty reduction, but iodine deficiency is mainly localized in leached upland soils (and has been highly responsive to salt fortification). Anaemia - which cuts physical productivity and raises maternal mortality among over 2 billion people - has, alone of the deficiency conditions, shown no decline during recent decades. See FAO 2000.
- 113 Schultz and Tansel 1997.
- 114 FAO/UNAIDS 2000.
- 115 Lipton and Osmani 1997; Quisumbing 1996; Estudillo and Otsuka 1999; Datt and Ravallion 1997; Behrman and Deolalikar 1988; Strauss and Thomas 1995; Schultz 1999.

- 116 Kingsbury, pers. comm.
- 117 Drèze and Gazdar 1997: 62-81.
- 118 Russell and Gilson 1997; Hecht *et al.* 1992; Nyonator and Kutzin 1999.
- 119 Zimbabwe: Hongoro 1993; Vietnam: Ensor and San 1996; Kenya: Mbugua *et al.* 1995; cf. Gilson 1997; Swaziland: Yoder 1989.
- 120 Where health and school fees are introduced together, these effects are sharpened; in a rural district in Uganda, over a quarter of cash expenditure was on school or medical fees, and long-term illnesses were making the poor poorer (Lucas and Nuwagaba 1999).
- 121 Reddy and Vandemortele 1996; Colclough 1993; Zimbabwe: Chisvo and Munro 1994; Malawi: Bray and Lillis 1988; Kenya: World Bank, 1995).
- 122 Appleton 1997.
- 123 Raczynski 1991.
- 124 Arhin 1994.
- 125 Payment does improve consumer involvement and control. There is a strong case for full-cost pricing of state services that enhance earning power mainly for the already well-off, e.g. university degrees, or residence costs in teaching hospitals; it is common, but unreasonable, for the state to give away or subsidize such largely urban elite services while charging user fees for basic health and education, especially in rural areas where both such services and their users are relatively poor.
- 126 Huffman and Steel 1995.
- 127 Hill 1991; Tamang and Dharam 1995.
- 128 Compulsion of collective, state or commune farms was motivated mainly by the search for economies of scale and by a wish to concentrate farming into points where food or timber could be cheaply extracted for urban use. These motives suggest that such modes of farm tenure are unlikely to help the poor, and also explain their near-universal failure. Forced collective or state farming helped cause millions of famine deaths in the Ukraine in 1931-35 and China in 1960-63, and tens of thousands in Ethiopia, Mozambique and elsewhere in Africa in the 1970s and 1980s. The objection is not to cooperation but to its top-down enforcement, inappropriate application to farmland, and use for extraction. If farmers and workers are permitted to reorder collective or cooperative assets, as in much of Latin America, they often prefer smallish cooperatives for assets with scale economies (milk-sheds, tractors); but for farmland they 'vote with their feet' for private, usually small-scale and equal, management (Thiesenhusen 1989: 497; Dorner 1992: 37, 41; Forster 1992: 575; Howard 1988: 5-14, on China; FAO 1991: 20, on Nicaragua; and Zevallos 1989: 50, on Ecuador).
- 129 Each farmer may refuse to contribute to management costs of (say) a marketing or irrigation cooperative, for fear that others will free-ride, raising his own cost.
- Cooperative outcomes may also be frustrated in prisoner's dilemma situations – e.g. each farmer may overgraze the commons – if that game/situation is unlikely to be repeated in similar form, so that a tit-for-tat cooperative equilibrium (Axelrod 1984) does not emerge. In such cases, cooperative enforcement benefits all, but can be imposed only externally. That is the case for subsidies to some sorts of cooperative.
- 130 Mexico: Burke 1979; Armenia: Csaki *et al.* 1995; Bangladesh: Wood and Palmer-Jones 1991.
- 131 On institutional aspects of rural 'common property' and their role in poverty reduction, see Ostrom 1990.
- 132 Individual titling of common lands can affect incentives to sustainable land use. In semi-arid areas, titling may stimulate long-run investment in conservation, e.g. terracing; the title means that the traditional land authority cannot prevent inheritance, so the gains from terracing are assured for the investing family (on Mbere, Kenya, see Hunt 1996). But environmental effects of titling can be negative if traditional modes of land management are superseded without group incentives or institutions to replace them. This was IFAD's experience with an otherwise successful and poverty-reducing project for consensual titling in Orissa, India.
- 133 However, common graziers seldom, with self-destructive selfishness, overgraze and destroy the pasture; it normally pays them to accept controls on cattle numbers and/or land quality, and indeed to pay authorities, including chiefs, to exercise such control in acceptable ways (Drinkwater 1991; Tapson 1990).
- 134 In pre-independence Zimbabwe, Ranger and Werbner (1990) show that farming in so-called 'communal' areas remained individualistic; lower productivity was due to soil, climate, and colonial denial of markets, research and infrastructure. When that denial ended after independence, smallholder maize output surged in communal areas. Communal tenure had not been a binding constraint (Roth and Bruce 1994: 34-6; Barrows and Roth 1989: 15-18).
- 135 See Noronha (1985) on communal tenure rights; on their consistency with efficiency also Blarel *et al.* 1991; Platteau 1993; Migot-Adholla *et al.* 1991; Place and Hazell 1993; and on investment incentives Sjaastad and Bromley 1997, and for Ghana, Besley 1995.
- 136 Lack of clear title did appear to constrain borrowing by small farmers in parts of Guatemala (Shearer *et al.* 1991: iv, 19) and Thailand (Feder *et al.* 1988), but individual, titled tenure has spread of its own accord.
- 137 Ault and Rutman 1979: 81.
- 138 Platteau 1992, 1993.
- 139 Nsabagasani 1997.
- 140 Jodha 1986.
- 141 Shanmugaratham 1996.
- 142 Shearer *et al.* 1991: iv, 9-10, 13.
- 143 Bandyopadhyay 1995.

- 144 Shearer *et al.* 1991: viii.
- 145 e.g. Mani and Gandhi 1994.
- 146 China: Lin 1992, McMillan *et al.* 1989; Niger: Gavain and Fafchamps 1996; Ghana: Besley 1995, Migot-Adholla *et al.* 1991.
- 147 In much of Latin America 'large landowners responded to the threat of tenancy reform by evicting all hired workers or tenants who could have claimed ownership under a reform program. The landlords either switched to livestock production and ranching or - aided by significant credit subsidies - shifted to highly mechanized cultivation' (Haddad *et al.* 2000; see also Deininger and Binswanger 1999; Binswanger *et al.* 1995; de Janvry and Sadoulet 1989). In India (Mearns 1999) tenancy reforms led to evictions, rotation among landlords' plots to prevent acquisition of occupancy rights, and worse tenure security (Appu 1997); and attempts to ban tenancy outright (e.g. in Uttar Pradesh, Orissa and Madhya Pradesh) led to concealed tenancy arrangements which were less secure, leading to loss, or at least 'informalization', of access to the poor of about 30% of their operated area (Ray 1996). In Nepal, tenancy regulations proved 'unenforceable [yet] harmful to the status of tenants [with] evictions, ... shifting of tenants to informal settlements, and rent increases' (Riedinger 1993: 26).
- 148 It has other advantages (frustrated by removing the options of sharecropping contracts, which deters many leases). (1) Tenancy reduces transaction costs associated with labour: the large landowner must supervise employees if he farms commercially, but need not supervise the work of tenants so intensively (Agarwal 1993) since if they work harder they produce and earn more. The poor villager must incur search costs to find farmwork, but if he/she rents a farm it can be worked when he/she chooses. (2) Much tenancy, perceived as absentee landlordism (Thorner 1980: 159), in intensive small-scale surveys proves to be land exchange in time and space (Ghose 1983: 124-5): temporary emigrants rent out land; locals rent out remote plots, rent in nearby ones, and cut journeys among fragments. (3) Tenancy lets landowners, without draught oxen, rent out to those with oxen but not land. (4) Tenancy lets villagers farm even if poor, uncreditworthy, and unable to borrow to buy land. Note the re-emergence of tenancy following egalitarian individual land reforms in China (Bruce and Harrell 1989: 18) and Albania (Stanfield *et al.* 1992: 2).
- 149 Swamy 1988: 555, 562; Singh 1990.
- 150 Parthasarathy 1991.
- 151 Mani and Gandhi 1994.
- 152 In poor areas of Ecuador in the 1970s and 1980s, cash saved by sharecroppers, out of farm income, allowed them to climb the ladder by buying farmland later (Forster 1989: 7). Without land reform, tenancy restriction can cut the rungs of this 'agricultural ladder' (Spillman 1919) and prevent escape from poverty.
- 153 In particular, sharecropping is often restricted because, without landlord-tenant deals, the sharecropper would produce less output than under fixed-rent or owner-occupancy (having to surrender part of his output to the landlord). But such deals are almost always found; theory and evidence reveal no efficiency losses due to sharecropping (Otsuka and Hayami 1988; Otsuka and Chuma 1992). Moreover, sharecropping can induce better management and supervision than alternatives; fixed-rent lease and wage employment raise the cost of management and supervision would be low. Because share-rent (unlike fixed-rent) is less when crops are poor, sharecropping reduces transient poverty - and increases incentive to grow profitable but risky crops (Faruqee and Carey 1997).
- 154 de Janvry, pers. comm.
- 155 Lieten 1996.

CHAPTER 4

TECHNOLOGY, NATURAL RESOURCES AND RURAL POVERTY REDUCTION

Unless the poor have the power to participate in deciding which technology to use, they are unlikely to benefit from it. Better farm technology will most benefit farmers who are active partners in setting priorities for both research and extension.

TECHNOLOGICAL CHOICES AND OPTIONS

Over 70% of the world's extreme poor live in rural areas. They use over half their income to obtain staple food; receive over two thirds of their calories from this low-cost source; and, usually, produce it themselves. Yet often they cannot afford enough food to provide safe amounts of energy or micronutrients.

Improved bio-agricultural technology and water control took hundreds of millions of people out of poverty in 1965-90, mainly by raising food-staples production, employment and affordability. Yet large regions and large numbers of the rural poor gained little from this achievement; and progress has slowed down across the world. In many areas technological changes did not take place. In other areas the potential of existing technology seems to be nearly exhausted. New challenges arise, from land lost to erosion, salinity and urban expansion, and from water depletion and diversion to towns. Important, too, is the need to provide adequate, attractive rural employment incomes, as the numbers of working-age people in most poor regions double in the next 35-45 years. New science can meet the challenges if the poor are allowed to par-

ticipate in the process. Radical changes in research incentives, organization and management, above all in the relationship between private and public, are needed. This report on rural poverty gives a special emphasis to technology.

New agricultural technology has its opponents; many people prefer to explore other ways to cut rural poverty. However, these alternatives are generally complementary to technical progress and are unlikely, without it, to generate an adequate rate of poverty reduction.

- The empowerment of the rural poor – 'the soul of IFAD' – must include better technology in support of their labour, land and other assets. If technology is weak or unsustainable, the power to control it is worth little. Unless the poor have the power to participate in decisions which determine their use of technology, they will be unlikely to benefit from its implementation. Better farm technology will do more for farmers who are active partners in setting priorities for research, as well as extension.
- Improved land and water management is not an alternative form of technical change to rapid bio-agricultural progress. Without bio-agricultural

progress, better land and water management will neither attract many farmers nor reduce poverty much.

- More available food, through technical development, is not an alternative to more food entitlements for the poor; it is often the most affordable way to provide entitlements, through extra income from small farms and hired work.
- Reducing urban poverty, and rural production of cash-crops, livestock or non-farm products, are not alternatives to the increased growth of staples through technology, but are helped by it.
- Better access to assets, institutions and markets for the poor are not alternatives to improved technology for production by the poor. Without such access, the returns to the poor from technical progress will be disappointing, as will their adoption of low-technology assets.

Why does this report emphasize the importance of staples in farm technology? The rural poor neither live by, nor produce, staples alone. Nonetheless, in South and East Asia, sub-Saharan Africa, marginal uplands and semi-arid lands, most of the poor still live mainly from farm or employment income from growing staples. Technical progress to raise income usually requires increases in the productivity of food staples, achieved by labour-intensive methods. In effect, most of the working poor continue to grow some food staples, and the poorest, having little land, usually buy more food than they sell. They gain in two ways if technical progress increases staples productivity – from cheaper consumption and higher income through more productive work. By reducing the risk of hunger, greater quantities, and reliability of food crops reduce the vulnerability of the poor.

Poverty is often concentrated in areas where the technology to improve the production of staples has not yet been introduced. The rapid reduction in poverty in 2000-20 requires technical progress that is substantial at smallholder level; that is quickly adopted by farmers across a wide range of

hitherto neglected areas; that creates productive employment; and that improves the growth of food crops, mainly staples.

To reach their targets, techniques to help the poor must be:

- capable of benefiting the mass of rural poor, whatever their status; and
- adapted to tightening constraints of water and land depletion and loss of biodiversity.

Agrotechnical progress has in the past usually occurred in small increments. It has spread slowly; in some cases, as with mechanization of draught, it has reduced employment without raising yields or making them more sustainable. The prospects of the rural poor have fortunately been transformed by the sharp acceleration since the 1950s of two very old forms of technical change that tend to raise staples yields and employment incomes: water control (greatly extended in South and South-East Asia and China in 1950-85), and plant and animal selection and breeding (culminating in the 1965-85 Green Revolution). Poverty incidence in affected rural areas fell, typically from 30-50% to 5-15%.

In spite of these advances, relevant outlays have plummeted since the early 1980s; and in some countries agricultural research, investment and extension are increasingly being privatized. Public and NGO outlays have not only been reduced but have also been diverted from water control and biological improvement. This has deflected effort from improving the production of poor people's food staples. Imaginative steps to reverse these trends are necessary for reviving the rapid reduction in rural poverty.

One plausible alternative – the substantial expansion of arable land – is not feasible for most rural populations in Asia, and increasingly in much of Africa and Latin America. In areas where it is feasible, it usually results in rising costs and falling returns. The expansion of staples into marginal areas has often exposed the crops to severe environmental stress (for example, maize in

Table 4.1: Rate of yield growth (percentage): cereals, roots and tubers, 1961-98

Cereals	Africa	Developing	E SE Asia	L. America & Caribbean	South Asia	Sub-Sahara
1961-71	1.03	2.76	1.96	1.43	1.88	(0.29)
1971-81	1.98	2.76	2.03	2.38	2.33	2.04
1981-91	(0.75)	1.86	1.67	0.74	3.09	(-0.07)
1991-98	(1.13)	1.55	0.86	2.72	1.7	(0.97)
1966-82	1.94	2.7	2.36	2.23	2.3	1.76
1982-98	0.75	1.67	1.35	2.05	2.69	(0.06)

Roots and tubers	Africa	Developing	E. SE Asia	L. America & Caribbean	South Asia	Sub-Sahara
1961-71	0.65	2.95	(0.4)	1.57	4.13	0.65
1971-81	1.52	1.19	2.92	-0.77	1.73	1.44
1981-91	1.95	0.73	1.06	1.07	1.62	1.91
1991-98	(0.34)	0.99	(0.09)	1.02	1.09	(0.25)
1966-82	0.61	1.12	2.38	-0.56	2.04	0.52
1982-98	1.42	0.7	(0.21)	0.87	1.5	1.42

Entries are exponential growth-trend fit betas. Numbers in brackets not significant at 10%.

* significant at 10%. All other entries significant at 5%.

Source: FAOSTAT data tape 1999.

Southern Africa and rice in East Bangladesh). In most cases increasing farm income and employment requires a raising of yields. Yet growth in the yield of staples has declined sharply (Table 4.1).

Staples yield growth in developing countries fell from 3% annually in the 1970s to barely 1% in the 1990s, and staples employment growth from about 2% to below 0.5%, far below the projected growth in the rural workforce through 2015. In the leading-edge areas, farm progress has faltered. Many of the remaining rural poor live in areas largely untouched by modern farm technology. In leading and lagging areas alike, further irrigation and agrochemical use are limited by degradation in natural resources. Appropriate, sustainable land and water management is essential, and advances in livestock and cash-crop technology are desirable.

Meeting the UN target to halve dollar poverty in 1995-2015 demands a revival in technical progress to improve sustainable production of staple foods, with the potential to enhance further employ-

ment. Yields can be raised through extension, but it seldom pays farmers to incur the costs and risks of achieving yields beyond, say, 30-50% of research-station yield potential. If the varieties of seed available are not improved, the farmers' yields will not improve either.

Institutions, markets and governments, in their efforts to convert the rural poor to the use of new techniques and technology, should stimulate suppliers and advisers to encourage and support farmers in their adoption of new methods and products.

What techniques are most likely to help the poor? Pro-poor techniques are likely to concentrate on food staples; on better use of water; and on methods of production that raise demand for labour; they are especially well suited for smaller and more deprived farms, particularly those with fewer assets.

New techniques should be:

- more productive of output per unit of input, that is, should cut unit cost;

- more labour-intensive (uses more labour per unit of land or fixed capital); but
- adapted to seasonal labour demand and food needs;
- more robust against climatic, pest and labour-supply risks;
- more stable in labour use and product-flow across seasons and years;
- selecting products mainly made and/or used by the poor;
- cutting or stabilizing the price of staples; and
- more sustainable in terms of land, water and biodiversity.

There is often a trade-off between these features which wise policy can reduce. For example, land sustainability may be enhanced with higher labour/capital ratios by incentives for measures to improve land, by installing vegetative barriers rather than contour bunds. All the above features (except biodiversity) were advanced by the spread of high-yielding cereals in 1965-85, leading to unprecedented poverty reduction.¹

TECHNICAL CHANGE TO BENEFIT THE POOR: LESSONS FROM HISTORY

In a time of popular politics and developed markets, it is now more likely than before that the poor will derive major gains from technology dedicated to improving farming output and employment. Agricultural progress has been driven by research on the farm for millennia; by formal public-sector research since the tenth century in China; and by the Darwin-Mendel scientific revolution which increased the power and pace of such research. Box 4.1 illustrates the process – and shows that some types of technical change have proved likely to spread fast and far and to the poor.

Information in Box 4.1 and recent experience confirm that technical progress in land and water management is usually slow to spread and to bring gains. First, innovations are slow to begin with, and resulting increases in national farm incomes

or sustainability are gradual and small. Second, for hundreds of years the range of available techniques has not been enlarged by researched inventions (in land and water management) that substantially raise farm incomes and/or sustainability over a large area. Third, recent decades have seen little acceleration in research outputs. All this is not to deny major local advances.

Much faster gains are normal with technical progress in land cover (animals, crops, varieties), water availability and plant nutrient enhancement. Farmers' choice among available techniques – including shifts among crops, animals, or varieties, together with appropriate nutrient enhancement, and especially with irrigation – often double farm output and income over wide areas in 20 years. Each phase of biochemical advance (Box 4.1) has produced faster farm growth than the previous one; but there is a striking contrast between fast, widespread farm transformation by variety-irrigation-nutrient technology and slow, localized progress from land/water-management technology. Making farmers rely on this, rather than better germplasm or water control, sentences them to a slow reduction in poverty. Most farmers must choose from a slowly changing set of land-water and agronomic methods. Moreover, it pays the farmer to upgrade these only when better germplasm or water control makes it reliable and profitable.

The advances in irrigation over the last two millennia have made much new land usable and boosted crop production on existing land. However, these changes have often produced perverse incentives, with free or subsidized water. This is becoming increasingly hard to maintain as water becomes dearer and scarcer. Water on high-grade land, irrigable for much of the year, will be shifted away from cereals, especially rice, to higher-value crops, such as vegetables. Pressure will be applied to find sustainable methods for growing food staples with high yields, on less productive lands. The

Box 4.1: The global sequence of agrotechnical progress

Each of these advances reduced the amount of work needed to buy food, yet raised demand for – and hence the food-affording capacity of – labour, except 4b, which normally arrives when non-farm labour demand is predominant and expanding.

Time/place	Agrotechnical progress	Information source
1. China c. 5000-2000BC, West Asia 3500-900BC, Europe 2500-700BC-200AD.	Neolithic settlement: from hunter-gathering to crop/animal farming, using sparse labour on underused land. Early crop selection and transformation (maize in Central America).	Bray 1986: 9, 86; Piggott 1981: 30; Ammerman and Cavalli-Sforza 1971
2. Asia 200-800AD, Europe's 'mediaeval revolution' of 600-1200AD. Somewhat later in Africa	First agricultural transformation responding to very slowly rising person/land ratios: from shifting cultivation to stable groups of fields; land levelling, terracing; initial rotation – often cattle as well as crops, interdependent via manuring, draught, and feed.	White 1962; Boserup 1965; Ishikawa 1968
2a. China, much of East/South-East Asia, Near East and North Africa, South India and Sri Lanka; 200BC-1400AD.	Where indicated by water situations, land settlement was followed by the first irrigation revolution: big, centrally managed tanks, but also many small wells and some artesian systems.	
3. China c. 900-1000AD. Europe 1650-1850, 'European colonies' after 1800	Biochemical revolution 1: intense rotation, organic manuring, crop-animal integration, systematic plant breeding	Bray 1986; Mingay 1968: 11; Jones 1974: 78-9
4. Asia, Europe, America 1880-1940	Biochemical revolution 2: applied plant nutrient science (Liebig), formal plant selection; guano, inorganic fertilizers.	
4a. North India, Pakistan, Bangladesh, river valley schemes in China, some of North and East Africa. 1850-90 and 1950-80	Where indicated by scarcities, 'second irrigation revolution' (dams, tubewells).	Pingali et al. 1987
4b. After 1920	As farm density rose (Asia) or rural labour scarcity bit (North America, later Europe), draught revolution hoe-animal-tractor	
5. North America from 1930, c. 1955-88 South and East Asia and Europe, parts of Latin America, bits of Africa.	Green Revolution: huge acceleration of staples plant-breeding progress.	

issue of how to make this more sustainable and reliable will become more important.

The biochemical Green Revolution and major irrigation expansion have stalled, after early success. Yet there are three grounds for hoping that poverty will be substantially reduced through further transformation of farming technology.

First, less responsive lands might increase yield, employment and income through sustainable, low-input techniques. But these, however successful, cannot contribute enough to reduce global poverty. There are difficulties:

- If low-input techniques are also low-output, they do not generate much food or income.
- Low-input, high-output techniques that do not increase plant or livestock conversion efficiency of water and nutrients into economic farm output must use up soil nutrients or water and are therefore likely to be unsustainable.
- If such techniques safely and substantially raised conversion efficiency, they would have been adopted by farmers long ago. IFAD's support for extension to accelerate adoption is justified. Areas that received more extension in the past are far quicker to adopt research findings later on,² but repeated efforts to introduce rejected innovations seldom achieve much.

The second ground for hope for agrotechnical transformation lies with areas (and perhaps crops) that seem less responsive but in reality are not so, at least not in 2000. In India and China since the early 1990s some agriculturally backward regions show higher marginal returns to irrigation, roads and/or research than the forward irrigated areas.³ In Southern and Eastern Africa, however, agricultural support outlays appear to have been skewed unduly towards slow-growing farming areas.⁴ Also, plants and animals in many such areas are selected for hardiness, despite scarce or unreliable water or nutrients, not for high yield when such inputs are ample. Substantial yield improvements are therefore much less likely from crossing within

species such as millets or goats, adapted to marginal semi-arid/arid environments, than within species such as rice or water buffalo, adapted to more resource-rich natural environments.

In these marginal environments, therefore, large rises in crop and livestock productivity may require introduced genes from other species. For many areas and crops, the best hopes lie in a revived Green Revolution, now being made more environmentally sensitive through biotechnology.⁵ The scientific prospects are excellent,⁶ but at present limited by the focus of research and development on a form of agriculture that caters mainly to rich people in rich countries, not to the food needs of the world's poor.⁷ In spite of promising signs of change, substantial gains for the rural poor will require reorganization and revival of public research, and new incentives to private research, both in developing countries and globally.

However, while research is critical, even within the sphere of technology, it is not enough on its own. The rural poor need more information about technological options. Given that sources of "advice" are proliferating (increasingly including private-sector interests and NGOs), it is imperative that the capacity of the poor to evaluate advice is enhanced. This is the necessary social revolution in technology: elevating the poor from technology objects (or recipients) to technology subjects, involved in specification of need, evaluation of responses and choice of productive strategies.

BIO-AGRICULTURAL RESEARCH

Farmers and breeders raise yields by genetic selection for plant shape or chemistry that improves response to the normal environment, and to unusually good or bad seasons for, say, rainfall or insect populations. The selection and manipulation of crops and animals into high-yielding varieties (HYVs) is as old as farming. Breeders speed up the process by scientific selection, controlled

Box 4.2: Crop and animal improvement versus biodiversity

There is a conflict in biotechnical progress between biological improvement and biodiversity.

Improvement favours predominance of plant and animal species and varieties that better meet local human needs to raise and stabilize economic returns, cut costs and displace unwanted life-forms (such as weeds). Crop and animal improvement, plus farmers' responses to incentives, mean that plants and animals currently perceived as economically 'good' drive out 'bad'. Yet this reduces biodiversity. Biodiversity permits complementarities (for example, among nutrient demands and supplies of different plants and animals). It prevents species attrition and losses that often prove disastrous later. Increasing reliance on a few carefully bred crop varieties contributes to a loss of spatial diversity in genetic resources, and to a common vulnerability to the same pest and weather-related risks. For example, IR-36 rice was planted on more than 10 million hectares in Asia. Such varietal specialization has occasionally led to widespread crop losses due to outbreaks of diseases and pests (tungro and brown planthopper in rice) and has necessarily diverted agricultural research expenditures from yield enhancement towards defensive research: maintenance research and germplasm conservation programmes (Anderson *et al.* 1987). Farmers resolve the conflict by, for example, rotation and mixing of crops and herds; formal researchers, by such means as seed banks. The pressures towards fast improvement are strongest for the poorest, but so is the damage if lost biodiversity induces sudden heavy losses due to pest attack.

crossing, and access to an increasingly wide range of crossing materials and methods. This greatly accelerates farm improvement and rural poverty reduction but also sharpens an age-old conflict between two needs of the rural poor: biological improvement and biodiversity (Box 4.2).

Soil enhancement by manuring, to increase yield, is as old as varietal selection by farmers. But modern agrochemicals (fertilizer, herbicides, pesticides) are barely older than modern plant breeding, which began about 150 years ago. They often complement the yield-enhancing properties of HYVs and make them pay better, but biological HYVs can also substitute for agrochemical paths to higher, more robust yields. Farmers gain if they can keep seeds that incorporate pest resistance or high response to plant nutrients, so avoiding loans at interest to buy pesticide or extra fertilizer. Poor farmers gain most, because it is harder for them to borrow or repay loans. Also, wrapping up fertility and pest resistance in the seed rather than in agrochemicals, if feasible, helps sustainable management of natural resources.

But reducing inorganic fertilizer use is harder than reducing pesticide use. Even the Chinese, with their long experience of organic farming,

have increasingly used inorganics as new varieties demanded more from the soil. If such varieties are more pest-resistant, the farmer uses fewer chemicals; but if they are more responsive to nutrients, it may pay him/her to use more chemicals. Use of chemical fertilizers, with careful planning and control, will probably continue to increase in most places as plant varieties improve. Current low fertilizer levels in most of Africa make good agricultural yields or incomes very hard to attain. With careful management, especially the prevention of nitrate and nitrite pollution of drinking water, health gains will far exceed ill-effects, as the poor acquire more income and food.

Agrochemicals and HYVs, when wisely used, have proved their great potential for reducing rural poverty. However, the transition since 1850 from farmer-dominated to scientist-dominated biological agricultural research, and since 1980 its increasing privatization, threaten to deny, to poor farmers and consumers, both gains from and control over technology. If technical progress excludes the poor, poverty will be little reduced even by improvements in assets, institutions and markets. IFAD has supported participatory research methods that have potential to remedy this problem (Box 4.2).

The pace of varietal improvement in main food staples has been dramatic. Yields were expanded by maize hybrids, and even more by semi-dwarf rice and wheat varieties that turned nutrients into grain rather than straw and which could be heavily fertilized without lodging. These varieties were enhanced to deal with an increasing range of agro-ecologies, water conditions and pests (and pest biotypes). The Green Revolution was the main source of a more-than-doubled aggregate food supply in Asia in 25 years, with only a 4% increase in the net cropped area.⁸ Tripled wheat and rice yields in that period were common over large areas of reliably watered cropland, in the Indian and Pakistan Punjab, Central Luzon, and the Muda scheme in Malaysia. By the late 1980s well over 80% of rice and wheat was planted to these high-yielding varieties, though yield gains in unirrigated areas were generally much smaller.

The Green Revolution kept food prices down and employment up. If an area doubled grain yields in the 1970s, as many did, employment per hectare normally rose by 40%, plus a further 30%

due to extra farm demand for rural non-farm products.⁹ Higher employment-based incomes meant extra food entitlements and cheaper food staples. Further, agriculture in the 1970s comprised 25-40% of GDP in the countries with a Green Revolution, which contributed substantially to their GDP and consumption growth. This typically accounts for 30-50% of international differences in speed of poverty reduction.¹⁰ Without the Green Revolution, the continuation of the near-stagnant yield trends of 1955-65 would have induced massive intensification of production and expansion into previously forested areas and other environmentally fragile lands,¹¹ encroaching upon their use by marginalized rural people who were often ethnic minorities.

Nevertheless, in the early days of the Green Revolution, some argued that, although large farmers gained, poor farmers lost. Some of the new varieties of grains prospered only with high levels of input and involved high risks that poor farmers could not easily afford or manage. But poor farmers learned to manage the new varieties;

Box 4.3: IFAD-supported work in the CGIAR: focusing on poorer areas can succeed

Since 1979 IFAD has committed USD 99 million to research programmes at CGIAR-centres, focusing on input-output relations in marginal rainfed environments; institutions and incentives to maximize returns and conservation for smallholder assets; and building local capacity for participatory research:

- In 1979-89 IFAD invested USD 8.32 million in a pioneering partnership of the International Centre for Agricultural Research in the Dry Areas (ICARDA) with a NARS (Egypt) that achieved big yield rises, and nutritional improvements, for faba beans.
- Research through ICARDA on wheat and barley for farming systems in the Near East and North Africa produced high-yielding varieties, tolerant to moisture stress, adopted by drought-prone farmers in 12 IFAD investment projects in the region in 1981-85.
- In 1980-86, IFAD financed USD 5.3 million of ICRISAT and International Centre for Tropical Agriculture research on maize-sorghum-legume mixed cropping, leading to sorghum varieties for highlands, including rotation with field beans, initially benefiting some 600 000 rainfed farmers.
- IFAD-supported research at ICRISAT led to ICPH-8, the first pigeon-pea hybrid specific to resource-poor conditions; improved lines led to 10-30% yield rises in eleven Asian countries.
- IFAD's USD 3.1 million leveraged USD 35 million donor support for International Institute of Tropical Agriculture work that developed successful biological control for the cassava mealy bug in sub-Saharan Africa. Millions of poor or near-poor African cassava growers benefited. Estimated benefit/cost ratio: over 200:1.

rural institutions learned to widen access to relevant inputs; and crop scientists developed new varieties such as IR-20 rice emphasizing robustness against main pests and yield enhancement even at low input levels.¹² The landless rural poor gained from HYV spread. First, nearby employment rose and stabilized across seasons and years, because HYV seeds tended to be planted in less risky irrigated lands and in the formerly slacker dry season, and from the early 1980s to be more robust than traditional varieties. Second, HYV production increased the availability and reduced the price of local staples, and reduced fluctuations. The poorest, who are usually net food buyers even in rural areas and the most likely to depend on hired work, gained much from such changes.¹³

Rural poverty in HYV areas fell owing to the use of HYVs. Yet even there, partly due to rising land values and returns, inequality seldom declined. Even in non-HYV areas of countries with substantial HYV spread, the landless poor sometimes gained more from cheaper food than they lost from reduced employment opportunities; and some non-HYV areas shared in the gains through labour migration for work in HYV areas.

The anti-poverty record of the Green Revolution was excellent. Nearby rural areas and cities in affected countries enjoyed the gains from the reduction of poverty.¹⁴ However, yields have risen much more slowly in the 1990s than in the 1970s, though the timing of the downturn varied among regions and staples (Table 4.1). The anti-poverty gains from the Green Revolution in well-watered wheat and rice areas were restricted in their spread by five factors.

1. Public agricultural research expenditure has fallen sharply in Latin America and Africa, and international outlays have been static in real terms since 1982; and from the mid-1980s outlays have been heavily diverted from biological crop improvement to other goals.
2. Yield growth has been slower for maize millets, sorghum, cassava, yams and sweet potatoes – staples eaten and/or grown by most of Africa's rural poor, and by many of the poorest elsewhere – than for wheat and rice.
3. Yield has grown more slowly even for the same crop in sparsely watered areas and in Africa.
4. Even in lead areas, yield growth has been slower since the 1980s. It has become harder to achieve gains in biochemically-based yields. Conventional research in breeding remains essential, but is used increasingly for defensive purposes: to select varieties less for higher yield *per se*, than for resistance against new pest biotypes, avoidance of micronutrient depletion, and adaptation to drought and more saline water.
5. The response of employment to a given yield enhancement in Asia is now about one third of 1970s levels owing to the increasing use of tractors and herbicides. This reflects, in part, rising real wage-rates and the retreat of poverty – but also the remaining subsidies on tractors, agrochemicals, fuel, or credit to obtain them.

Some of these trends are responses to the steady fall in global staples prices relative to fertilizer costs. Some reflect normal diminishing returns, as irrigation, improved varieties, fertilizers and research go first to the most promising areas and crops. These tendencies always slow down technical change, and are offset by extra demand for staples due to population and income growth and the livestock revolution.¹⁵

This does not explain why biological advance slowed down in the 1990s in the developing world more than elsewhere; or why it is less employment-intensive now than in the 1970s and 1980s. Two major factors are less emphasis on public research and its increasing need to be defensive. The success of the Green Revolution relied on the combination of international research developing improved varieties suitable for many conditions, and national agricultural research systems (NARS)

screening and crossing such varieties to suit local conditions. This partnership breaks down if NARS are denied funds, especially as the need for local adaptation of improved varieties for more diverse areas increases.

What are the priorities in bio-agricultural research to help the poor? Since the mid-1980s, CGIAR¹⁶ has sharply reduced the proportion of its expenditure committed to breeding for yield and yield potential. This would seem to correspond to: many poor farmers' preferences; the need to concentrate effort in regions of high poverty, where crop yield is harder to increase; and the new development agenda, which stresses priorities other than yield or income, such as risk reduction, gender equity and concern for the environment. Yet staples yield and yield potential need increased emphasis, to attack rural poverty by expanding income based on employment, while the growth of the workforce continues.

The CGIAR and IFAD observe increasing concentration of low yields and poverty on ill-watered areas, usually under environmental stress, with increasingly hazardous life chances for some poor groups. Diverting research towards these areas requires participation with local farmers and research institutions, not uniform varieties of single crops to suit all circumstances. Where farmers are consulted about their priorities, they often select priorities other than yield.¹⁷ From 1980 the CGIAR moved away from breeding for yield, especially yield potential, towards such issues as environment, gender and distribution, and towards less promising crops and areas.

Yet this has probably helped to reduce the growth in the yield of staples even for lead areas of the Green Revolution, and has been ineffective in delivering growth to some of the areas where the poor are increasingly concentrated. Farm and food yields and output-per-person have fallen since the late 1960s in much of Africa. Research must now be refocused on yield.

The funding of the ICRISAT indicated a shift towards poor people's regions and crops (millet, sorghum, chickpeas and pigeon peas). Returns on some of this investment have been substantial. In India and China some of the initially neglected rainfed areas now show better returns to research – and more poverty reduction per extra research dollar – than do irrigated lead areas. There are cases of successful outreach to smallholders through bio-agricultural research in non-lead areas, usually in conjunction with improved water management and, more rarely, in drought-prone areas with higher-yielding coarse staples.¹⁸

The case for expansion of research for poorer areas faces several problems.

- Crops such as sorghum are selected to thrive with low, fluctuating moisture and nutrient inputs; but harsh environments punish plants with high input requirements. It is unsure, slow and costly to seek high-yielding yet safe varieties by breeding within the genetic range of these crops.
- Using marginal, low-humus lands to grow high-yield, continuous crops may be unsustainable, for example if adequate nutrient replacement is uneconomic.
- While well-watered deltaic or irrigated areas have many common features, rainfed – and especially rain-underfed – areas are diverse. A particular HYV or hybrid is therefore likely to have a limited range of usefulness.
- Although conventional breeding in HYV lead areas brings dwindling yield gains, it remains vital to defend yields against new pests, water scarcity and micronutrient shortage. Yet given the high proportion of staples output and employment in lead areas, the sharp slowdown of yield growth – probably due in part to a shift of research priorities elsewhere – harms the poor.
- Finally, growth in yield everywhere depends ultimately on increasing yield potential.

How can one reconcile the needs of the poor in three areas of bio-agricultural research: helping

neglected groups in diverse drylands; revive yield growth in the breadbasket areas; and developing new technology to raise yields and yield potentials?

Bio-agricultural innovation can aim to increase conversion efficiency; partition efficiency (the proportion of the plant or animal comprising food or other economically valuable materials); or extraction efficiency (the capacity of plant or animal to find and use up nutrients or water). Extraction efficiency for a nutrient is exhaustive and not sustainable in soils that release little to the plant. Partition efficiency has been pushed near the limit with wheat and rice, but can still be improved by breeding in some crops, and perhaps animals, for less favoured areas. But the main emphasis for bio-agricultural research in less-favoured areas has to be on improving plants' or animals' conversion efficiency – especially if they are to be sustainably manageable by the poor.

Improving conversion efficiency has proved difficult within the range of genetic material of some species concentrated in less favoured areas: species can be adapted to robustness but at the cost of high yields. The possibilities made available by the ability to insert genetic material into crop and livestock species are vital. Wide crosses can achieve this within conventional plant breeding. For example, West African red rice (*O. glaberrima*), adapted to upland and swamp farming in parts of West Africa, is robust, of short-duration and weed-competitive, but gives very low yields. It has successfully been crossed by the West Africa Rice Development Association (WARDA) with Asian paddy (*O. Sativa*). Another example is triticale, which Borlaug produced by crossing high-yielding wheat with cold-resistant rye, producing a new crop that has substantially raised food yields on millions of hectares in cold climates.

Successes such as these are rare, because these approaches are technically difficult, inaccurate as regards gene transfer, and slow. Most developing

countries can apply and develop usable varieties from genetic modification (GM), but not all have the resources on their own to do so. Increasingly the findings of research into GM are locked into patents held by a small number of powerful research institutions. Some companies may occasionally provide free information to low-income regions. More often, GM research is steered towards fields where those companies can gather most profit.

Moreover, although food safety and biodiversity issues raised by GM are in principle the same as those raised by other biological or chemical routes to farm product improvement,¹⁹ GM has been a catalyst in public concern about these issues. Genetically modified crops have the potential to reduce the poverty of the poor by increasing their supply of food from difficult land, but it is only with the full participation of civil society and institutions that the technology can be shared and applied. The effects of ignoring new approaches to poverty, nutrition, hunger and survival could be very damaging.

Micronutrient enrichment of food staples illustrates how GM is a powerful weapon in the armoury of breeding. The extent of the poor's micronutrient deficiencies and the resulting deaths are well documented: cures need not wait until much higher incomes permit all to escape the problem through diverse diets. Medium-term progress is possible through food fortification (especially with iodine). But iron anaemia has not retreated globally; anaemia and Vitamin A deficiency remains widespread. Conventional non-GM plant breeding can address some of these issues; for example, an experimental rice variety rich in iron and zinc, IR-68144, has induced a leap in serum ferritin in an anaemic population in the Philippines. However, only by GM, Vitamin A could have been introduced into the rice endosperm. Both breakthroughs have been made available free to developing-country research insti-

tutions. If successful varieties can be developed for relevant agro-ecologies, they will contribute towards saving millions from blindness, mostly among Asia's rural poor. Only bio-agricultural research currently promises micronutrient benefits of comparable speed, spread and cheapness. Nevertheless, as is the case for any new variety, there are risks. These should be identified and judged against the expected benefit.²⁰

Bio-agricultural research for crop-water response is crucial to the rural poor, both because the poor are most harmed by tightening water scarcity, and because they are most exposed to risks of drought and least able to bear them. Already in 1972, the International Rice Research Institute (IRRI) identified moisture stress resistance as the main rice breeding priority. For the poor in many arid/semi-arid borderline areas, there is a critical research choice between two goals, neither so far successfully pursued²¹ but both more credible with GM: breeding much better yields into robust but low-yielding millets, or better moisture stress resistance (especially capacity to delay anther formation if rain is late) into fragile but higher-yielding hybrid maize.

Increasing water scarcities require breeding (and managing) plants and animals for water economy – that is, high yield per litre, including capacity to return reusable water to ground or surface sources. As responses to water involve many genes, knowledge of specific gene functions in each host plant or animal type (functional genomics) is needed for major progress with transgenics. Timed response to local water conditions and needs is essential. These are issues for joint land-water and bio-agricultural design, management and research, not for isolated and unconnecting studies. Few crop research agencies outside CGIAR employ economists or hydrologists; if they do, specialists are seldom involved in decisions on research priorities.²²

Bio-agricultural research and its extension are crucial to pest management. Pesticides can stimu-

late new, resistant pest biotypes, requiring ever more expenditure on ever less effective chemicals. This pesticide treadmill harms poor farmers most: from pesticide-polluted drinking water which poisons many farmers,²³ to endangering of economically important non-targeted species, including pest parasites. Bio-agricultural research can reduce pesticide contamination by plant selection and breeding, and can control pests by introduced parasites (Box 4.4).

Overwhelmingly the main source of biological pest control, even within integrated pest management (IPM), will continue to be selection and breeding of host crops and animals. This can become defensive, to limit harm from new pest biotypes. The rural poor, being most risk-averse and least able to buy the right pesticides on time, gain most from this. Rice bioscience had to shift from TN1, IR8 and others – winners of yield competitions that proved to be museums of insect [and other] pests – to today's rice varieties, which are better than traditional varieties at coping with the six major rice pests. A series of IRRI varieties were crucial in providing more stable resistance to emerging biotypes of brown planthopper. Uganda's success in breeding cassava resistant to the new (UgV) strain of cassava mosaic virus combined frontier plant genetics, important national research, donor support and skilful local extension in reversing huge economic and nutritional losses from this strain.²⁴ In 1997-99 GM research proved necessary to provide resistance to devastating rice yellow mottle virus in West Africa.

While safer than pesticides, some aspects of pest-resistant plant breeding could be safer still. First, most new varieties unduly stimulate emergence of new, virulent pest biotypes. These can be reduced by seeking: moderate resistance that allows the pest to damage, say, 5-10% of plants; tolerance, aiming not to destroy or avoid pathogens but to permit affected plants to survive damage; or horizontal control, using several plant

Box 4.4: Integrated pest management in Indonesia

In the early 1980s, Indonesian lowland rice was infested with the brown planthopper *Nilaparvata lugens*. Farmers applied pesticides intensively and IRRI conducted trials to breed plant resistance, but the scale of the problem prevented small farmers from controlling it economically. In 1986, the government (supported by FAO) announced its IPM policy, prompted by evidence that pesticide use was no longer increasing rice yields, and, by destroying natural-enemy populations, was destabilizing production systems. The main components of IPM were: banning many insecticides; reducing or removing pesticide subsidies; and strengthening crop protection and related research and extension institutions. By 1992, over 150 000 farmers had been trained to observe and understand the local ecology of the planthopper and its natural enemies and to follow simple threshold rules.

During 1987-90 the quantity of pesticides used on rice was halved. Yields increased by 15%. Extra net profits were USD 218 per IPM-trained farmer per season. The government saved USD 120 million a year (85%) of subsidies, which was partly used for the IPM initiative. Several lessons can be extrapolated to other high-potential rice-producing areas:

- Successful IPM requires access to education.
- Understanding the ecology of the rice field is a critical issue for IPM training.
- IPM training instructors must be aware of the local farming experience in the region.
- IPM should be part of extension worker training; farmers are the best candidates to be IPM trainers.

In high-potential areas, management-intensive IPM techniques offer low external input (and consequently low material cost) options for poor farmers. Through training in IPM and involvement in local initiatives to eradicate pests, farmers learn that they can jointly manage and improve their environments. Reduced health risks improves the livelihoods of rural farmers and farmworkers.

Whatever the IPM methods, natural selection implies that pests hit back with new biotypes. Hence an essential long-run component of IPM is a steady succession of improved pest-resistant varieties, such as IR-26, IR-36, IR-64 and IR-76, against evolving biotypes of the brown planthopper. This requires NARS in the field, working with farmers, to test, adapt and sometimes cross these emerging varieties.

Sources: Kenmore 1991; van Veen 1997; USDA/VARS 1993; van de Fliert et al. 1995; Hazell et al. 2000.

genes against the pest instead of a high barrier from just one. Second, in some crops and areas, breeders' very success has seriously lowered the biodiversity of farm populations: good, pest-resistant, profitable species and varieties drive out others. Although individual modern varieties tend to be more resistant to main pest species than traditional varieties, a population dominated by one such variety can be very vulnerable to virulent new pathogens, as with the resurgence in 1972 of southern corn blight (*H. Maydis*) in the United States and tungro rice virus in the Philippines. In each case researchers developed new resistant varieties in only two seasons.

Delays in research on plant breeding can harm the poor. How long can the poor wait without

severe harm? And will research respond to new biotypes of pest, when they attack the new maize hybrids spread in Ethiopia, or adapted HYV rice in West Africa?

Lessons for pest management are:

- to improve biodiversity of modern plant and animal populations;
- to improve and duplicate both *ex situ* collections and *in situ* 'gene parks', so that a wide range of varieties remains available as a source of genetic material;
- to shift bio-agricultural research and extension towards horizontal, tolerant and/or moderate-resistant varieties;
- to assist in this, to stimulate genomics research to find pest-related roles of host and non-host

genes, and to improve pest management via inter-species gene transfer.²⁵

- to see host pest resistance and tolerance in the context of IPM, including biological controls and appropriate pesticides; and
- to improve farmer participation (in pest research as well as reporting new pest problems: see the IFAD-supported example in Box 4.5).

Agricultural research and extension should focus on varieties that both suit the conditions of small and labour-intensive farmers, and that demand and reward workers rather than tractor-owners or herbicide manufacturers. Raising demand for labour, especially in slack seasons, is most needed where the rural poor rely mainly on employment for income. The researchers' main task is to enhance and stabilize yield; but their varietal choice affects the demand for employment and whether farmers demand more labour or more machines or chemicals. Publicly subsidized

research should not develop or improve tools or varieties that, without raising yields, cut employment for poor hired workers. Research policy should normally shift farmers' inputs towards labour and away from other inputs.

Allocating funds within research or extension requires economic analysis, both of benefit-cost ratios and of the distribution of benefits. This is still rare in NARS. The persistent absence of congruence between allocation of research among products and their importance for employing and feeding the poor means that poor people's products, such as sorghum and goats, are still under-researched, especially in traditionally neglected regions. Such species as sorghum and goats are under-researched at national level because they are written off as low-potential, yet are often low-yielding partly because under-researched, despite high returns to research. Seeking congruence makes no sense if the under-researched crops or animals

Box 4.5: Collaboration between farmers and researchers

- **Better varieties can stimulate revival and adaptation of traditional pest management methods.** Worldwide, over USD 300 million of pigeon pea, mostly grown by poor farmers, are lost yearly to pod-borer. In India by 1993, costly chemical controls predominated. At a farmers' meeting organized by an NGO (Research in Environment, Education and Development Society), an elder showed the defunct method of shaking larvae gently on to a plastic sheet and feeding them to chickens. In 1997 IFAD supported evaluation in a 15 ha watershed by ICRISAT. By 1999 the method had spread to thousands of farmers. It is a key component of the IPM strategy for pigeon pea.
- **Farmers creolise research-station releases;** ICRISAT millets and International Centre for Maize and Wheat Improvement maizes are crossed with landraces to suit local conditions and preferences, even at the cost of losing hybrid vigour in maize, as in the late 1990s by smallholders in Chiapas, Mexico.
- **Farmers experiment with new plant types,** as with the spread of cocoa in Ghana, or new combinations of plant type and land management, as in the indigenous agricultural revolution of mangrove rice in Sierra Leone.
- In many countries, a small subset of farmers, often on frontiers among agroecologies – e.g. for rice in Bumpah village, Sierra Leone – specialize in **selecting new varieties,** planting out in various conditions, and selling – with advice – to others, often from hundreds of miles away.
- With appropriate amendments (testing larger populations of fewer alternative varieties), introducing collaborative even more than consultative **farmer participation** into **breeding staples** improves returns, biodiversity, speed and local relevance, especially in drier areas, as with rice in India and beans for women farmers in Rwanda.
- Where there is something worth extending, formal extension has substantial, documented returns. But farmers often get **bio-agricultural advice** from other farmers and/or migrants.

Sources: ICRISAT 2000: 5-6; Bellon and Risopoulos 1999; Hill 1957; Richards 1985; Witcombe 2000; Witcombe et al. 2000a, 2000b; Virk et al. 2000; Sperling and Berkowitz 1994; Evenson 1999, 2000: 264.

are unpromising for research; but new research methods offer new hopes. Even now, in Pakistan, if research outlays were in proportion to outputs, poor farmers' benefits would rise significantly.²⁶

What about regional congruence? Current under-emphasis on some rainfed or less-developed regions harms output and efficiency, as well as the poor. In China, returns to extra agricultural research and development in the poorest (Western) region are 15% above the (already high) country average, and 140 people are brought out of poverty per 100 000 yuan of extra research investment, as against 34 nationally. In India in 1994, the impact of extra research on agricultural production in the sixth most fertile of 12 rainfed regions is double the impact in irrigated areas, and each million rupees of extra research investment takes 13 people out of poverty annually, as against one.²⁷

The IRRI-supported Eastern India Rainfed Rice Project involved 'local scientists who had never conducted on-farm research' in learning as well as teaching improved management practices and farming systems in areas previously 'all but overlooked by advances in rice science'. Since 1996 these six States have produced all India's extra rice production, by shifting resources to the neglected area with future potential; better rice varieties, robust in rainfed conditions; and participatory research.²⁸ Box 4.5 provides evidence of the gains from linking formal research to farmers' own methods and experiments.

Farmer-researcher collaboration is needed to remedy another serious lack of congruence. Of formal non-commercial pest-control research, well below 10% goes to countering weeds, birds and rats. Yet these probably cause over half the poor's crop losses. A side-effect is that controls are over-dependent on agrochemicals. Only a large new research thrust, by farmers and formal systems together, can remedy this.

Participation is the ally, not the enemy, of formal research in benefiting farmers. But farmers are not

the same as the rural poor in needs, tastes or preferences. Both participatory and conventional research give little say – less than most market research and much less than market demand or political action – to non-farmer food consumers or workers, or even tiny farmers who buy most of their food. Where such people comprise most of the poor, neither participatory nor top-down research, in current form, sufficiently involves the poor as agents.

Nevertheless, farmer participation in agricultural research usually raises poor people's welfare, for example, by stimulating choices that deal effectively with local problems, spread labour peaks, cut risks and improve or cheapen food. That impact will improve if indigenous research and extension are better integrated with the formal system. Issues relating to local farmers' priorities are still seldom considered in experimental design, especially in NARS; yet they are crucial, especially for the poor on marginal lands, in risk diffusion and labour and food planning.

IMPROVED LAND MANAGEMENT TECHNOLOGY (ILMT): LAND AS A NATURAL RESOURCE

ILMT is sorely needed to raise or maintain the quality of natural resources. Examples include range management to reduce overgrazing; the restoration of soil humus through the application of composts, rotational grazing, crop rotation, agroforestry²⁹ and fallow systems; land reclamation; and earth or vegetative barriers against erosion. ILMT can cut serious losses of farmland, which in developing countries around 1970 amounted to 200-300 000 ha a year from salinity and waterlogging alone, plus large areas to urban expansion. As for the loss of land quality, by 1990 about one fifth of land in developing countries (excluding wastelands) was affected by soil erosion or nutrient loss, two thirds of it badly enough to destroy or greatly reduce land usefulness for agricultural production. Every year the average cropped hectare in Africa loses over 30 kg

of nitrogen, phosphorus and potassium. Land degradation in the late 1980s cost 3% of GDP each year in Java, 4-16% of agricultural GDP in Mali, and 10% of annual agricultural production in Costa Rica. Such estimates are controversial and may be somewhat too high, but the poor lose proportionately more, having fewer options or defences and being concentrated on poorest quality land. Land degradation is worst in hotspots, such as the foothills of the Himalayas, sloping areas in Southern China, South-East Asia, and the Andes, forest margins of East Asia and the Amazon, rangelands in Africa and West and Central Asia, and the Sahel.³⁰

Bio-agricultural research seldom provides much of a remedy for this on its own. That makes a powerful case for ILMT. But unlike the adoption of fertilizer, new varieties, or many crops, ILMT innovation normally requires extra fixed capital and a time lag before benefits gradually accrue, which is not an attractive option for poor farmers. The rural poor may thus be slow to embrace ILMT. They need their scanty income for consumables now; they cannot afford sacrifices to invest in long-term land stability, and have more difficulty in borrowing money, especially for ILMT with perhaps small and distant returns. Moreover, poor rural people often interact with land in ways that give few incentives for long-sighted management: as labourers or short-term tenants, often with little security, supervision or extension.

ILMT is essential to prevent land degradation from threatening the poor's chances to improve employment incomes and food entitlements from the dwindling land remaining. However, the cause of ILMT is ill served by claims of large or fast gains in yields, employment, or the income of the poor, especially through low-external-input farming; because there is a weak empirical base for such claims.

Farmers know the problems of land degradation, but are reluctant to allocate resources with high opportunity costs for remote, uncertain or insecure benefits.³¹ In India ILMT investments decrease where time spent in other activities has higher returns, or benefits are vulnerable to water use or drainage upstream – or insecure land tenure, as in Morocco, Mali, Tanzania, Ethiopia and Ecuador. There is much evidence that farmers take sensible conservation measures if they pay, limiting overgrazing³² and maintaining forest islands and galleries.³³ The task is to ensure that incentives and institutions stimulate conservationist ILMTs.

To attract poor farmers, ILMT should not conserve at the expense of production, and preferably should itself be productive (for example, construction of vegetative bunds which provide fodder).³⁴ Pure conservation, even by simple methods, is seldom attractive to farmers.^{35,36} Further, adoption of new techniques must suit the timed labour availability of the household (Box 4.6), and take

Box 4.6: Labour availability and new technology in land management/conservation

Timing construction to coincide with the slack season is desirable where feasible (when the soil is not too wet, hard or compacted) and if local labour remains available. However, vegetative barriers must usually be planted at the start of the rains. In the slack season many men in Africa migrate for funerals or weddings, or to seek work in the mines.

Male migration, which is often a consequence of past land degradation, means that many smallholder households become female-headed (30% in Malawi). Women have difficulty in finding replacement heavy labour, for example, to make stone bunds. In the Calicanto watershed, Bolivia, widespread migration to non-farm work, while desirable to raise and stabilize labour incomes, impeded labour availability for ILMT works. Research and extension should examine timing and needs, and match labour to techniques.

Sources: IFAD 1992b; Mangisoni and Phiri 1996; Zimmerer 1993; Reij et al. 1996; Chaker et al. 1996; Shaka et al. 1996.

account of other needs. Indian small farmers favoured boundary bunds over contour bunds as they could be used to demarcate property.³⁷

Many disincentives to conservation by ILMT arise from public policy. Deforestation and use of lands for possibly unsustainable cropping in north-west Brazil have been stimulated by tax incentives and publicly subsidized roads.³⁸ Conservation activities are impeded if a farmer must share benefits with others, and institutions to ensure shared effort are weak, inequitable or costly to engage with; projects concentrating on individual users are more successful than wider efforts.³⁹

ILMT and conservation seek to use labour to save land, but indigenous ILMT typically uses little labour. Farmers are not interested in a more labour-intensive approach proposed from outside. They see more rewarding uses for their time and need the income from labour quickly. But where a proposed new ILMT is moderately rewarding, safe and swift, farmers, including poor ones, use it – as in Ethiopia, but only where it does not reduce current yield, unless they have low discount rates or special incentives.⁴⁰ Most successfully extended ILMTs for conservation involve biological intervention enabling some swift, direct gain to be achieved as well, such as vetiver hedge barriers to erosion, and eucalyptus.

Conversely, inducing conservation ILMT by subsidy has sometimes diverted farmers' and public resources from better uses, whether because the works would have been done anyway or because they are not worth doing.⁴¹ It makes sense to subsidize people to carry out ILMT conservation only if social benefits are sufficiently high relative to cost, while benefits to private conservation investors are not, except with the subsidy. This in turn requires at least one of three things. Net benefits, accruing to and not recoverable from other people, may be sufficiently large. Future losses, risks or thresholds, in the absence of conservation,

may be insufficiently discounted, because poverty requires high preference for quick income, or because of high credit costs. Or there may be distributional gains for the poor from the conservation ILMT not readily achieved otherwise.

Conservation tillage (CT)

This involves reducing or eliminating ploughing, resulting in a protective mulch on the soil surface (the residues from previous crops). This protects soil from wind and rain erosion, encourages water percolation, and improves the physical and chemical characteristics of the soil by retaining more soil organic matter, moisture and nitrogen. Yields may be increased slightly, but the main benefit is reduced land preparation costs.⁴² However, CT applies only to soils that do not become too hard to be sown without first ploughing or hoeing. CT illustrates the complementary relationship between so-called low-external-input farming and external inputs. For many lighter textured soils, conventional tillage is mainly a means of weed control. Replacing it with CT may require the application of herbicides, especially in the first year or two without ploughing. For CT to be really attractive to farmers, yields should also increase. This can be achieved by introducing leguminous cover crops into the rotation, extra mulch or extra inorganic fertilizer.

In Latin America, the Latin American Conservation Agriculture Network (RELACO), a network promoting CT, was established in 1992. By 1998 more than 14 million hectares were under CT, with seed planted by a specially designed chisel plough which cut the costs of land preparation (Box 4.7, Table 1). Production costs per hectare of soybeans could be cut by USD 12 million in Argentina and USD 5 million in Brazil.⁴³ But, since distribution of cropland there is very unequal, most cost-cutting would benefit large, non-poor farmers. Much, too, would correspond to reduced demand for employment of very poor tillage workers: note the

Box 4.7: Conservation tillage in Chiapas, Mexico and Ghana

On the steep hillsides of Chiapas, Mexico, soil degradation is exacerbated by intensive maize and bean cropping to meet most local demand for food (though perennials such as coffee can improve matters). Conservation tillage offers promise. It requires farmers to use the residues of previous crops as protective mulch for soil; to minimize tillage, to avoid destroying the mulch; and to replace manual weed control with herbicides. CT also conserves water (reducing risk from drought) and reduces burning of crop residues and thus risk of forest fires. Net returns are higher when both the low tillage and mulch components of CT are practised, as are labour productivity and returns per day (Table 1). CT seems efficient while promoting sustainability and food security.

Table 1: Budgets for maize-bean intercropping, 1993 summer cycle, Motozintla, Chiapas

	Non-adopters	Mulch only	No-tillage only	Mulch and no-tillage
Gross benefit mxUSD/ha	1953	1941	1971	2210
Total var. cost USD/ha, inputs + labour	1291	1304	1227	1242
Total inputs mxUSD/ha	358	370	450	446
Total labour mxUSD/ha	933	934	777	796
Total fixed costs	326	539	326	539
Net benefit mxUSD/ha	336	99	418	428
Labour productivity (kg maize/day)	28.0	28.5	32.8	36.1
Return/day (mxUSD)	13.6	11.1	15.4	15.4

Source: Erenstein and Iniguez 1997.

In much of Ghana, slash-and-burn methods with traditional tillage are practised. This loses mulch and requires long fallow periods to allow for full land regeneration. These become less affordable as person/land ratios rise and shortening fallows degrade the land. Strategy to deal with this may include shifting to CT, with higher initial costs (and, even with hand weeding, some extra chemical inputs), but higher profits. This almost certainly permits shorter sustainable fallows. Labour costs (and incomes) are not recorded separately, but a fall might harm some of the poor.

Table 2: Costs and returns for three tillage systems in Ghana, 1997

Treatment	Variable costs (USD /ha)	Net profit	
		USD /ha	%
Slash and burn	56.25	360	100
Roundup + hand weeding	76.5	567	158
Roundup + Lasso + Atrazine	85.75	713	198

Source: Hazell et al., 2000, citing Ghana Crop Research Institute.

big fall in labour costs (employment income) from CT in Ghana in Box 4.7. Unless land is fairly equally distributed and few labourers are landless, the poverty impact from CT in such conditions is at best dubious. It would be more appropriate in areas where land is more equally distributed and

where the proportion of cheap staples grown using CT would be higher, such as in parts of Africa.

Box 4.7, Table 2, shows the variable costs and profit of maize production under three tillage systems in 32 comparison plots. Farm income rises, and as less labour is used, returns per labour day

rise too; but the poorest may lose hired work. However, heavy weed growth is usually transient and herbicide and spraying costs fall with time. CT offers the advantage of early planting: farmers do not have to wait for the rain to soften the soil prior to ploughing. Nevertheless, conservation tillage on African smallholdings remains constrained by lack of credit and the absence of commercial input suppliers of herbicides. Other constraints relate to difficulties in maintaining the surface mulch due to grazing; fast breakdown of organic matter; the use of crop residues for fuel; and consumption by termites.⁴⁴

Land reclamation

Two main forms of land loss seriously harm the rural poor. In lowland irrigated regions, salinity has caused large losses of prime farmland. Each year, globally, land abandoned due to salinity is about equal to land developed for irrigation.⁴⁵ The other source of loss is erosion, especially on slopes in arid and semi-arid areas, and above all in Africa, where in 1992, 4% of the area under vegetation was seriously degraded and 18% lightly degraded – about half of this due to overgrazing.⁴⁶

Degradation of such lands does not reflect ignorance or recklessness, but lack of incentives and the indifference of institutions serving the farmers. Some land reclamation might indeed boost farm incomes and productivity.

It is difficult, expensive and often slow to improve saline or waterlogged land. Labour-intensive reclamation is more pro-poor, but viable only on suitable terrain, and with high population densities. Techniques for reclaiming lands commonly include moving soil and installing drainage pipes. Mulching to modify the hydraulic properties at the soil surface can address secondary salinization. Ploughing, with tractors or livestock-pulling wooden ploughs that can cultivate to 30 cm, can rehabilitate abandoned soils.⁴⁷ More employment-generating reclamation practices

include freshwater harvesting from ponds that form in gullies by constructing simple earth check dams, digging pits and refilling with the same soil, planting vegetative barriers with leguminous species, and afforestation with salt-tolerant species.

These practices are most relevant to the rural poor, who lack mechanized equipment, especially as establishing permanent vegetative cover with salt-tolerant trees and grasses provides income (firewood and fodder) as well as rehabilitating saline lands. The grasses provide some income for the poor while the trees grow (though the poor's access to the trees needs to be assured). In India, *prospis*, *acacia* and *casuarina* are useful trees and produce organic matter that enhances soil productivity. Soil pH fell (10.3 to 8.9 after six years) when salt-tolerant grasses were intercropped. *Prosopis* and grass grown together, producing poles, woodfuel and fodder crops, provided a net income of Rs. 4866 per farmer.⁴⁸ However, income and employment levels for the poor after reclamation seldom approach those before the land became saline, except from *Casuarina*. Box 4.8 highlights IFAD's experience with reducing soil salinity in the North China Plain (Hebei, Agricultural Development Project), combining mechanized and labour-intensive techniques.

Labour-intensive reclamation and subsequent maintenance techniques are usually more successful in reclaiming overgrazed or eroded than saline lands, but working populations tend to be sparser and more seasonal. Such techniques include earth or stone contour bunds; water harvesting; digging and refilling pits; and planting appropriate vegetative erosion barriers or species that can compete successfully with the thorn *acacia* which otherwise makes the areas ungrazable. Contour earth bunds were promoted by colonial extension officers in Western India for decades, but seldom worked well. Success depends on all, or almost all, farmers maintaining their part of the bund; that is, on high levels of collective action. How can benefits to secure

Box 4.8: Community-led land reclamation efforts in China

IFAD responded to a soil salinity problem in the North China Plain by supporting the *Hebei Agricultural Development Project* (1982-89). The soils of Quzhou and Nanpi, the counties where the project operated, are coarse, light silt loams, well suited to maize, wheat and cotton when adequately drained. However, years of irrigation and poor drainage made about half the farmland in the counties saline enough to inhibit agricultural productivity, particularly for the rural poor, who live on the most marginal lands.

Low-cost labour-intensive technologies were largely used to reclaim saline lands, though tractors were used at times. Drainage works to lower the water-table and reduce surface pooling of stagnant water involved excavating 17.6 million m³ for drainage systems by manual labour, far surpassing targets. Land levelling of 11 000 ha allowed salt to be leached from soils, simplifying planting. Most tree-planting was less successful (propagation was inhibited by residual salt) but some community orchards were successfully established, providing nutritional and income gains.

Conditions improved greatly during the project. Landholdings increased, as did production of wheat, cotton and maize. Salinity greatly decreased and seemed likely to stay low, although continued monitoring and evaluation by the communities affected was a key requirement for long-term sustainability. Large labour requirements associated with the project worked against households with low adult/child ratios and unable to diversify. The communal philosophy of assisting neighbours and extended family alleviated some of the emerging disparity. The economic rate of return for the project was 19%; 23 000 ha of land were reclaimed through the project and 35 200 households lifted from poverty.

Source: IFAD data and project documents.

this be made faster, clearer, less unequal? Stone bunds require advance capital commitment and yield no obvious income. Vegetative barriers are more attractive to the poor, yielding quicker direct income (fodder) and, if not in competition with main crops, net benefits from nutrient cycling, and sometimes nitrogen fixation. Hedgerows, as in IFAD's East Java Rainfed Agriculture Project, have been called 'the most promising technique for soil and water conservation'. Vetiver, widely used traditionally, has advantages that assist extension: breaches are less erosive than in earth or stone bund, maintenance is light and the crop is drought-resistant and provides thatching, mulch or fodder. In Katsina State, Nigeria, vetiver reduced erosion both in boundary hedgerows and as grass contour strips. Where erosion has gone too far, humus and water management, building on traditional techniques, can reclaim some land (Box 4.9).⁴⁹

Several points about these small-scale, locally based ILMT techniques should be noted.

- They tend to succeed with low-input techniques in part of the approach only because of high-input techniques elsewhere (manure and/or

mulch with fertilizers, labour-intensive reclamation with initial bulldozing).

- They often achieve good results for the intended conservation aims, but, in contrast to many improved plant or animal varieties, yield or output growth is localized, small or doubtful (Box 4.8 may illustrate an exception).
- Some current income gain, for example from vetiver as fodder, is required to provide an incentive to expand the scope of what are, after all, usually familiar methods.
- Pro-poor distribution of benefit is not automatic; conservation should not be about rich farmers securing cheap gains by mobilizing poor clients who gain nothing.
- IFAD experience suggests that ILMT gains are often sustainable only if followed up with means, such as herd taxes, to discourage overgrazing of commons or situations where 'the better-off herders... graze their cattle on the common lands [and later move them to] well-fenced individual plots'.⁵⁰
- Without good crop and animal varieties, poor farmers seldom find it pays to divert resources to

Box 4.9: Land reclamation through soil and water conservation, Burkina Faso and Niger

Where large-scale erosion control had failed, the IFAD-funded Special Programme for Soil and Water Conservation provided current income, while improving or reclaiming about 5 800 ha of abandoned and degraded lands on the farms of some 6 000 households in 77 villages, through *tassas* (called *zai* in Burkina Faso). The soils had been sealed by a thin crust, hardened by wind and water, preventing infiltration by water. Such areas are usually abandoned, without vegetation, scattered with outcroppings of iron crust. They are prime sites for surface erosion. *Tassas* are 20-30 cm dug holes, filled with manure since the soils normally lack organic matter. This also promotes termites in the dry season, further enhancing infiltration. When it rains, the holes fill with water and farmers then plant millet or sorghum. *Tassas* are normally used with bunds from stones that farmers remove from fields for planting. These methods were learned by farmers of Illéla on a visit to Yatenga in Burkina Faso where, on the central plateau alone, some 100 000 ha have been restored – each now producing some 700-1 000 kg of cereal per year. Yields of millet without *tassas*, *demi-lunes* and bunds are 150-300 kg/ha. They rise to 400 kg with manure in a poor rainfall year, and 700-1 000 kg/ha in a good year. Fertilizer raises yields to 650 kg/ha in poor years and 1 400-1 500 kg/ha in good ones.

Tassas have allowed the region to attain average millet yields of 480 kg/ha, reaching 700 kg/ha with fertilizer (still uncommon). Fields of similar quality without *tassas* produced only 130 kg/ha. Food availability in participating households rose by 20-40%, depending on local rainfall. The average family in Burkina Faso and Niger using these technologies shifted from an annual cereal deficit of 644 kg (six and a half months of food shortage) to a surplus of 153 kg.

Tassas are best suited to landholdings with family labour, or where workers can be hired. The technique has spawned a network of young day-labourers who have mastered it. Rather than migrating, they move among villages to satisfy farmers' growing demands. Some farmers, recognizing potential profits from *tassas* early, bought back land. Three factors were key to developing and disseminating the technology:

- (1) an action-research approach that is flexible, open to farmer initiatives, and conducive to negotiation;
- (2) a technology that is quick, simple, compatible with existing cropping systems, and replicable; and
- (3) a technological package that can adjust to the changing local context.

Source: Pretty 2000, citing Mascaretti, pers. comm.; Reij 1996; Hassan 1996; IFAD project documents.

wide-scale, long-term conservation and reclamation. Yet without these, the land to support better varieties may continue to degrade.

- There must be progress on research on ILMT and bio-agricultural research together for either to succeed.

WATER TECHNOLOGY AND THE POOR

The World Bank⁵¹ has identified the main single environmental problem for the poor, alongside water quality, as water depletion, particularly in the context of scientific consensus on global warming, with less reliable rainfall and higher evapotranspiration. Technical progress in farming since the mid-1960s dramatically cut rural poverty where there had usually been earlier improved water control. For two millennia, the rural poor

have reached sustainable prosperity, if at all, mainly by applying known innovations that enhance water reliability and control, or through biological inventions which allow swift yield-enhancement in already well-watered areas. Rapid poverty reduction has long eluded people in large semi-arid tracts, especially in Africa. Even if transgenics bring gains in drought tolerance, without more water for crops and animals, rapid reduction in poverty will be difficult to achieve.

Technology can promote better plant types that raise each litre's output or poverty impact; ILMT is often inseparable from water conservation and development (Box 4.10). Raising water-use efficiency (WUE) is possible: a good benchmark is 50%, but typically only 40% is achieved (60% of field water fails to reach the crop root zone), mainly due

Box 4.10: Water efficiency: conveyance, field, use; economic and social

Water engineers concentrate on **water-use efficiency (WUE)**, i.e. the proportion of irrigation system water that reaches the crop root zone. **Conveyance efficiency (CE)** is the proportion of irrigation system water that reaches cropped fields and **field efficiency (FE)** is the proportion of water applied to the field that reaches the cropped zone: so $WUE = CE \times FE$. Even technically, these are not the only determinants of **economic efficiency of water (EEW)**. The worth of a given FE depends on whether the water reaches, and is drained from, the root zone at the right times; and on how much of the water that does is absorbed by the crop, transpired to manage moisture stress, or diverted to weeds. The worth of a given CE depends on the quality (non-pollution) of the water before and after conveyance.

EEW is the value added to output by the water, as a proportion of the extra cost incurred to obtain it. WUE can come at too high a cost, actually cutting EEW; for example, sprinklers usually show higher WUE than gravity systems, but are more maintenance-intensive. Excessive emphasis on WUE in Zimbabwe has led to costly, possibly unsustainable, schemes (Heinemann pers. comm.).

Private and social EEW can differ greatly if some costs or benefits of water accrue not to the user but to the taxpayer, or to downstream free-riders – or victims, if water becomes polluted on its travels, or causes salinity or flooding due to poor drainage. Private and social EEW are enhanced by growing crops with higher returns to water. Finally, even if WUE, private and social EEW all improve, some poor water users might lose. Some means to improvement, such as centre-pivot systems, save water by using much capital not accessible to poorer farmers – who thereby become less able to compete – and displace poor workers.

So in principle more FE or CE need not raise WUE; more WUE need not raise private EEW; more private EEW need not imply more social EEW, and more social EEW might not help the poor. All these need checking. Yet in practice the big technical inefficiencies suggested by disparities in WUE – together with the known under-performance, mismanagement and sometimes corruption of some big irrigation systems – suggest scope for increasing WUE compatibly with gains in EEW and equity alike. This suggests focusing on irrigation techniques and technologies to increase WUE. Changed irrigation frequency and volume, rotational irrigation, cross-bunding, new drainage systems, canal lining, and other methods need evaluation. These complement bioagronomic ways to improve WUE, e.g. changing crops, varieties, or timings of operations, or improving weed control (Joshi and Singh 1994), or to improve CE, e.g. by control of water hyacinth in canals.

to spillage, leakage, infiltration and evaporation.⁵² In sub-Saharan Africa WUEs are normally around 20-30%.⁵³ Conveyance efficiency (CE) can also be raised by reducing seepage (for example, through unlined or badly maintained canals), percolation and evaporation (Box 4.10).

If prices, institutions or environment⁵⁴ are not too hostile, water management techniques can improve WUE, raise economic efficiency of water and help the poor. Canal lining reduces seepage and leakage, raising WUE and CE respectively by 5-10%.⁵⁵ But lining field canals may not reward farmers; or appropriate materials, hired skills, or extension may not be available. However, seepage, evaporation and percolation are also due to excess water storage in the field. Poor farmers can

address this problem by irrigating less frequently and making the best use of rains. Intermittent flooding in Asian paddies can reduce water requirements by about 40% with no significant decline in yields. However, while a farmer who cuts seepage and percolation enjoys more water, farmers downstream may then get less. In Northern Pakistan, overall WUE is only 30% due to mountains and coarse soil, but CE is 90% since downstream users benefit. In this case, greater upstream WUE – through technical progress or by water pricing – could cut CE, and thus water downstream.⁵⁶

High evapotranspiration inevitably opens a gap between WUE and the benefit to the farmer in hot climates, but can sometimes be cut by cost-

effective techniques that create employment. Covering reservoir surfaces is expensive, but there are alternatives. The irrigated area of Ethiopia might rise 20-40% if irrigation sources are used fully at night and weekends.⁵⁷ Any measure which reduces exposure time to atmosphere, or mean exposure temperature of irrigation water, reduces evaporation: for example, pipes to convey water, or tubewell irrigation. In the North China Plain piping irrigation water results in 90% CE, compared with 50-60% for earth canals.⁵⁸

However, it is costly capital, rather than (poor people's) employment, that is saving the water. How accessible are such techniques for the rural poor? Sprinkler irrigation allows water to be applied gradually to large areas of crop. This commonly leads to 70-80% WUE,⁵⁹ but usually at high capital cost for installation and spares. Though still expensive, lower-cost, easy-maintenance gravity-fed sprinkler systems proved attractive to some poor farmers in Lesotho. Drip irrigation often involves underground pipes, applying water direct to the root zone. This can give the same potato yield as furrow irrigation with half the water, and in Israel cut water use per hectare by one third. Nutrients can be applied to the crop with the water. Since drip irrigation wets the soil only in the root zones, access to the field is easier. Again, this is capital-intensive and costly per unit of water saved. IFAD has encouraged its use in Egypt, where conventional ways to raise WUE are unattractive to farmers due to lack of direct irrigation charges. In Israel and Jordan, up to 60% of irrigated area has been converted to drip systems. Tubewell irrigation, though sometimes more expensive than canal irrigation, can work more in favour of the poor due to its modularity which enables water to be more easily controlled. Poor farmers can access tubewells via markets; this gives tubewell owners direct incentives to raise CE, provided there is little distance between tubewell and field compared with previous water sources.⁶⁰

While such techniques suit middle-income or labour-scarce environments, more labour-intensive methods would be more cost-effective to reduce poverty in the poorest regions, which often have labour surpluses, at least in slack seasons. But invention and innovation in irrigation techniques and water management that replace water use with employment are scarce and slow owing to lack of water use and management research resources, their weak integration with crop research and with farmers, and their relative neglect of simple gravity-flow methods. Cross-bunding is an obvious simple option. Less well-known is porous pot irrigation – an affordable, efficient method which has spread from North Africa to other countries. It involves a series of interconnected unglazed pots buried in the soil with openings exposed. Seeds are planted round the pots, which are then filled with water. As with drip irrigation, water is applied to the plants very slowly. The technique is best suited to those with low opportunity-cost of labour, such as the rural poor: small farmers and family artisans who make the pots.⁶¹

New techniques are also relevant to improving WUE where alternatives are sought to desubsidizing irrigation and drinking water, which, while desirable, is sometimes not politically, or occasionally even technically, feasible.⁶² Relevant techniques include computer-aided scheduling of water allocation, based on forecast needs allowing for weather, crop-water requirements and area cultivated, as in the Mae Klong scheme in Thailand. Such techniques will improve and spread as information technology gets cheaper. Yet small farmers may be disadvantaged unless they can reap economies of scale, access equipment and software, obtain information and hire expertise through an appropriate water users' group. The Bali Irrigation Project illustrates the need to involve such groups in innovation and technical choice. External agents tried to replace traditional weirs with structures that could vary distribution

according to crop-water requirements. However, the technology was inappropriate to local needs and institutions, and drew management responsibility away from the water users' groups.⁶³

Recycling can substantially improve conveyance efficiency. The Fayoum system in Egypt has WUE of over 60% because water unused by the crops, which seeps into the groundwater, is pumped up, increasing water availability on-site. Also downstream cultivators can collect run-off or pump groundwater which has resulted from low WUE up-stream. Conjunctive use of ground and surface water aims to optimize their joint use over time; one approach is to pump groundwater only in dry periods, and surface irrigation otherwise. In India, in theory, groundwater should normally be used for crops only from January to May, and rains plus surface irrigation should suffice at other times, especially for paddy.⁶⁴ But such rules of thumb are hard to enforce given power-structures, externalities,⁶⁵ downstream effects and sometimes corruption. They also allow too little for large local and short-term temporal variation in crop and other water uses and availabilities, in evapotranspiration rates, in preferences and costs, and in the needs of poor water users, who are less able to adapt to water failure or the resulting shortage of food or of employment income.⁶⁶

There are many ways to improve the efficiency of both irrigation and drinking water delivery and use. The best way forward is often to work in partnership by combining rural people's own systems with technical expertise. This is shown by uses of water harvesting, sandriders, valley-bottom systems such as *sadama* in Nigeria, and stream diversion methods such as *molapo* in Botswana. These systems were discovered by local farmers themselves, and are easily maintained by them. But without formal research and innovation, such systems spread and improve too slowly to reduce poverty enough. Most traditional methods have little application (without external scientific

inputs) to rural management of drinking water, but bring dirty and dangerous water, stress and frequent water shortages.

What can water technology do to help eliminate rural poverty and address the problem of declining natural resources? There is much to be done to improve adequate rural drinking water for domestic and farm use. Old irrigation systems decline, and in large areas the lack of water precludes much benefit from improved seeds. Better plant and animal varieties have raised water demand by increasing the returns to extra water in well-watered areas, while doing little for parched areas. Rural water demand has also risen along with income, the livestock revolution with its higher grain requirements, and population. These pressures will continue, probably exacerbated by global warming. In spite of pressure to reduce agriculture's share in water use, water technology can be applied to offset these effects and reduce rural poverty.

More research is needed in developing countries on sustainable water use and supplementary systems, and for better integration of both with farmers' own techniques and preferences, and with bio-agricultural research. Discovery in water technology has been slow, despite huge growth in irrigated area in 1950-90. It is unlikely that the problems of water can be resolved without faster technical progress in farm water location, extraction, recycling and drainage.

The World Water Council⁶⁷ sets out the urgent case and priorities for expanded water research funding for the CGIAR and nationally. The special water needs of the rural poor must be integrated into such research. Infant mortality for the rural poor is much higher than for the urban poor. Such deaths are swollen by disease due to dirty water. The poor's productive progress is frustrated by lack of water control. Their main resource, labour, can earn incomes by constructing better water systems, but only if appropriate research choices are made early.

More controversial is the need for much more irrigation, including major schemes, in sub-Saharan Africa. Yields, income and employment from most unirrigated areas, especially for main staples, have stagnated or fallen for three decades, and, without dramatic breakthroughs in suitable plant varieties, are unlikely to increase fast enough to make an impression on extensive rural poverty. Yet only 1-5% of African cropland is irrigated (depending on how we classify traditional water management) as against 30-35% in Asia. Typically yields and farm incomes per hectare are between two and four times higher on irrigated land, and their growth has been far faster.

Africa's low irrigation levels are in part due to donors' change in support to farmer-managed schemes, which, although beneficial, have lower outreach and may divert from large schemes. Some of these have been partly successful: Mwea in Kenya, Gezira and Managil in The Sudan. However, from the costly failures of the 1970s, especially in West Africa, the World Bank, IFAD and others concluded that 'large-scale projects have not yielded the expected results and did not principally benefit [the poor;] small-scale farmer-managed irrigation [is] more suited to their needs'. The 14 IFAD-supported projects in Eastern and Southern Africa with 'important water management components aim to support irrigated production on about 40 000 ha, about evenly divided between rehabilitation and improvement of existing farmer-managed schemes and construction of new ones'. Capital costs were USD 3 000 per hectare⁶⁸ - far below the USD 8 300 per hectare cost of major schemes (Box 3.10). However, even a large and determined donor such as IFAD over several years could support irrigation for only 30 000-60 000 smallholders, in this region with tens of millions, overwhelmingly unirrigated. 'Small on-farm irrigation only' will not greatly dent African rural poverty.

Large-scale irrigation techniques in Africa have faced many problems:

- high construction costs due to monopolistic and sometimes corrupt foreign contractors;
- settlement, not of smallholders, but of capital-intensive, inexperienced government clients;
- top-down imposition of cropping patterns;
- uncompetitive farming systems, with water and (inappropriate) crops heavily subsidized at the expense of other areas (for example, irrigated rice vs. rainfed beverage crops in West Africa);
- weak and badly maintained distribution systems, linked to spreading water-borne diseases; and
- weak marketing and extension arrangements.

Though returns to irrigation in Africa have been improving (Box 3.10), partly because market distortions are much less, not all these issues have been fully addressed. Large-scale irrigation will fail if public managers abuse it, whether to reward clients with subsidies rather than to enable farmers to work more profitably, or to centralize farm decisions upon water controllers, turning irrigated farmers into pieceworkers. Yet such lessons have been learned in many countries. In Eastern and Southern Africa, the Food and Agriculture Organization of the United Nations (FAO) estimates that, of 38 million hectares suitable for cultivation, some 17 million have good irrigation potential, but only 3 million (mostly in Mozambique or on large farms in South Africa) are water-controlled.⁶⁹ While medium-to-large irrigation will be economical only for a minority of these lands, it should not be assumed to be economically or environmentally unacceptable. National water stress is increased by denying smallholder irrigation to areas, like parts of the Eastern Cape of South Africa or many riverine and lakeside areas throughout the continent, with underused water not suitable for use outside farming. It is time both to accelerate the spread of small-scale water management in Africa and to reassess the conventional wisdom about large-scale irrigation.

Excuses are offered for the delay in addressing the problem of irrigation in Africa. 'African irrigation is made less attractive by general inferiority, water-unresponsiveness, variation, or fragility in soils, climates or terrains': this makes little sense, given the huge and localized variation within both Africa and Asia. 'Costs of construction in Africa are much higher than in Asia': the gap has narrowed, and is partly due to excessive reliance in Africa on ex-colonial contractors with market or political power. 'Traditional irrigation systems occur where appropriate; these alone should be spread': they do show good sustainability, but spread slowly, perhaps because on their own they seldom improve income, output or employment fast. 'Crop, animal, and land-management research must concentrate on rainfed areas': this is reasonable while they occupy 95-99% of arable land, but this is only a consequence of past neglect and lack of alternatives in both irrigation and appropriate research. This neglect of irrigation has done vast harm by denying the African poor a Green Revolution.

It is vital to place more emphasis on researching and spreading pro-poor water control techniques, instead of assuming that they already exist but that farmers refuse to adopt them, or that traditional methods already serve the rural poor well. Crop and animal farming can and should increase value-added per unit of water; and in some areas (near many African lakes and rivers) irrigate with farmer-managed systems or medium or even large-sized schemes.

In many cases, especially in semi-arid lands and where there is little water control, external support for its improvement and expansion with farmer and client participation is pro-poor, and a precondition of rapid growth. This has to accompany desubsidization of water for productive use, and recognition that, with urbanization and development, agriculture's share of commercially extracted water should and will fall.

PRO-POOR TECHNIQUES IN OTHER RURAL ACTIVITIES

Although much could be said about the application of technology to many natural resources, we focus on technology where its prospects are most important for where the poorest live, what they work in, and what they eat. For most of the world's poor, economic advancement will continue to depend on crops, especially staple foods. Yet livestock are the main income and employment source for many poor rural people, especially in arid areas of Asia and the Horn of Africa. Elsewhere cattle are integrated into the farming systems as sources of draught and manure, and as users of crop residues. Indeed, their competing uses, for meat, milk, manure, draught, transport, store-of-value and so forth, render technology improvement harder, and policy generalizations less useful, than for crops. In spite of valuable work, research and innovation globally have been much slower, and more concentrated on the needs of wealthy farmers and consumers, for livestock than for crops. Chapter 3 examines ways to improve the benefits to the rural poor from livestock assets. The implications for research and technology are: a shift from cattle to animals more likely to be owned and managed by the poor (sheep, goats, pigs, poultry, donkeys); and, within cattle technology, a shift (in research on both productivity and disease control) towards small herds and their uses and feed.

A special issue relates to draught power. The shift from hoes via draught animals to machines is often desirable, as in parts of South-East Asia today, because wage-rates and employment are rising and labour is getting scarce. Too often, however, the causality is reversed: mechanization, especially the use of tractors, has received open or hidden subsidy, has displaced labour, and caused employment incomes to fall, causing harm to the poor with negligible production benefits. Aid-backed research into mechanization of ploughing,

rice transplanting, reaping, weeding and so on for South Asia or sub-Saharan Africa reduces the incomes of the poorest, and is hardly ever justifiable. Despite such hidden subsidy to labour displacement, technology generation for animal draught (for example, better yokes and harnesses for animal traction in Africa), let alone hoe methods, is on a very small scale.

What of technologies for the rural non-farm sector? This sector is increasingly important, but the parts of it that can most effectively help the rural poor depend mainly on growing demand from nearby agriculture, and will prosper if farm technology drives ahead. As such, public rural non-farm sector research seems unlikely to succeed. In most developing countries, the rural non-farm sector, being much less homogeneous even than farming, lacks the professional organization, public-sector technical expertise, or common features that bring economies of scale and external benefits from publicly-supported research. In general, no overall technology policy for such a diverse sector makes sense (much less so than is the case for agriculture). State attempts to provide it often misperceive problems, build in inflexibility, and rest upon little public-sector expertise. It is more constructive to facilitate flexible sector growth, especially in trade, transport and construction, by providing training and stimulating the economic spread of relevant rural services while regulating monopolies.

TECHNOLOGY, THE SECOND INDUSTRIAL REVOLUTION AND THE RURAL POOR: CONCLUSIONS AND IMPLICATIONS FOR RESEARCH ORGANIZATION

Technical progress increased farm productivity and released labour, capital, food and timber to fuel the first industrial revolution in northern Europe and the United States. Many decades later, the new technologies revolutionized agricultural growth. In the North this was mainly

through labour-saving innovations, from tractors to herbicides, suited to the demands of developed economies. But these innovations spread labour-displacing methods even to poor economies with fast-growing workforces. More appropriate land-saving techniques emerged only in the Green Revolution around 1965-85, largely where they were supported by water control and fertilizers. As discussed above, this reduced poverty in many countries, but that progress has slowed, leaving large parts of the developing world little affected. Renewed progress is essential for adequate advance in food staples yields, employment and hence rural poverty reduction. Land and water management techniques, meanwhile, have improved and spread very slowly; despite limited effect on yields, their acceleration is essential to contain soil and water degradation in the face of population growth, agrochemicals, growing effective demand for water diversion from agriculture, and probable climate change. In view of the reduced support for *pro bono* agricultural research, and increasing privatization and patenting of much agrotechnical progress, this raises serious difficulties for new pro-poor techniques in developing agricultures.

The 1990s saw great advances in biotechnology and the delivery of information. So far, these advances raised farm productivity mainly through labour displacement, favoured larger farms, and in spite of growing more food were not necessarily pro-poor in agriculture. Yet biotechnology and informatics in principle raise productivity through skills and communications; are neutral in scale; and may help small farmers to move from traditional to new methods with less reliance on innovations from the intervening stage of capital- and chemical-intensive farming.

For this to happen, and for farm income growth to revive and spread to the neglected areas where the poor now concentrate, changes are needed in agricultural research organization and funding.

Partnerships need strengthening between:

- farmers' own research and formal research systems;
- private and public or *pro bono* research;
- bio-agricultural and land-water research;
- low-external-input and high-external-input farm techniques; and
- work for leading regions and for backward regions.

Historically, poverty reduction has rested on pro-poor technical progress that raised entitlements to food staples. Since 1950 rising numbers of workers seeking employment income and, recently, the threat of land and water degradation made technical progress more urgent. Progress took two forms: the innovation of irrigation and water control especially in 1950-80; and the invention of new plant and animal types especially in 1960-85. Both irrigation expansion and biological yield-enhancement, especially for drylands, have slowed down. Environmental challenges, especially water depletion, require new ways to save and manage land and water, yet land-water management technologies have been historically slow to change, spread, or raise output or employment, though they are often successful at conserving resources.

There appear to be three ways forward. Low external-input agriculture faces a stark choice. With low outputs, employment and food entitlements will be inadequate. If high output is obtained by extracting water and nutrients, these are mined unsustainably; if by converting them more efficiently, farmers have generally discovered the methods already, yet remain poor. Accelerating conventional agricultural research and extension for previously backward areas is starting to show high returns in some cases, but is limited by the need to revive growth of employment and food output in the breadbaskets, and by the fact that farm crops and animals in resource-poor areas have been selected - by farmers and by nature - for robustness, not for high yields, restricting the scope for improving such species by conventional breeding. Thus genetic improvement of the

species themselves, for which transgenics is the most promising method (as long as potential damage to human health and the environment are avoided), seems needed to revive growth in tropical yield potential. Output from economic best practice for farmers will always lag behind yield potential, but as best practice from existing crop and animal varieties spreads among farmers, new varieties with higher yield potential are needed to keep farm output, employment and food entitlements moving forwards. Genetic improvement of species also seems the only way to achieve some goals (such as rapidly reducing death and blindness from Vitamin A deficiency in very poor rice-eaters).

Whether by conventional or by transgenic techniques, bio-agricultural research can help the poor by wrapping the benefits in the seed rather than requiring costly purchases of inputs. Carefully planned seed research has raised farm output even at low levels of agrochemical inputs. The Green Revolution has induced a massive reduction in poverty for labourers and small farmers by increasing employment and restraining food prices, and has reduced the pressure to grow food crops on fragile land-water systems; yet its slowdown, and crop and geographic limits, have become evident. Though not the only causes, internal research and technology issues are strongly implicated: cuts in funding for public research; its diversion from germplasm improvement; and, within germplasm research, increasing concentration on defence against crop pests at the cost of yield expansion. There is a hard choice facing bio-agricultural research: concentrating on the diverse, recalcitrant farm circumstances of growing proportions of the rural poor, developing many fine-tuned varieties; or re-addressing the potential growth in yield by developing a few varieties to fit a wide range of conditions.

Improving the nutrition, income and employment of the poor requires advances on both fronts.

An important bio-agricultural contribution can be made to improved environmental sustainability, through both biodiversity and varieties of crops and animals able to produce high returns with less polluting and depleting methods of land-soil-water management. Yet progress on both fronts will require not just major new funding, but also the addressing of an overriding issue of research organization: the drain of leading-edge work from the public sector into a few large firms. Their concentration of research on assisting large farmers and processors, and their development of techniques (e.g. the 'terminator') to impede farm-to-farm spread of new varieties, deflect interest from the needs of the poor. The increasing drive for profits from research, and the increasing use of patents, should not preclude attention to reducing poverty.

Integration of bio-agricultural research with other activities to improve the robustness, sustainability and yields of poor people's farming is a priority. Stable pest management requires breeding for horizontal, less-than-total resistance and/or tolerance, with awareness of farmers' own pest management procedures and experiments, while reducing the risks that reduced biodiversity will stimulate unmanageable new pest biotypes.

Institutions such as IFAD can help the CGIAR and NARS to recognize how pro-poor research can involve not just smallholders but landless workers. Workers with no land need time-specific employment income; that is not simply a farm cost for researchers to minimize like other costs.

Water technology problems and options carry similar lessons and implications for research organization. Water supply to agriculture is under increasing pressure from falling groundwater tables, deteriorating surface irrigation systems, and diversion to domestic and industrial needs (although often justified), accompanied in many areas by increased evaporation, and probably less reliable (and reduced) mean rainfall due to cli-

matic change. Yet the main contributors to the reduction of rural poverty since 1950 have been the spread of new staples varieties, and the extra irrigation that assisted their success. With the spread of irrigation reduced by decreasing returns and increasing price disincentives, ways to alleviate the water squeeze become vital for renewed growth in the yield of staples, rural employment, and hence poverty reduction. Prices and markets, institutions and water-yielding asset distribution can all help. But better methods of water delivery, economy and control are vital.

There has been less research in the field of water delivery; what there was, was less successful than bio-agricultural research, and these two areas were not integrated. Technical improvements in water-use efficiency are attainable, but if this is to increase the economic efficiency of water, let alone the share of benefit flowing to the poor, plant scientists and economists must work together with irrigation researchers and, above all, farm users themselves. As with other technical choices, so for water; farmers' traditional micro-methods and, building on these, collaborative, participatory methods in extension, trials and formal research itself, are not a populist alternative to research-station work; each needs to support the other.

Incentives and institutions should ensure that timely and available labour, rather than capital, is used and rewarded to save and control farm water. But some changes seem inescapable as current subsidies to over-use of farm water are phased out. Expensive and complex irrigation systems will increasingly be used to grow high-value crops, increasing the pressure on both biological and water research for technical paths to increased staples output, per litre and per hectare, from cheaper irrigation systems and sustainable rainfed production. Despite the growing water deficit in many countries, most of sub-Saharan Africa seems unlikely to achieve sharp improvements in the growth in staples yield and in the employment

of the farmers growing staples without raising the proportions of cropland irrigated from the current 1-5% towards typical Asian ratios of 30-40%. Some progress is possible through small farmer-managed schemes, building on traditional methods, but improvement requires more expansion of implementation capacity in publicly supported domestic extension and maintenance, and in funds. For a large reduction in rural poverty, large formal schemes, as well as development of small farmer-managed water control, will be needed.

Technology and institutions ultimately determine not only the poor's access to assets and to local and global markets, but also to growth, distribution, and, in the end, poverty. This report on rural poverty places more than the usual emphasis on technical change. Many people see technical change as determined: by economic advantage as shown by crop and factor prices; by changing population or environment; or by institutions that set agendas for science and technology. But new science and technology affect economic, political, demographic and environmental outcomes, as well as being affected by them. New scientific breakthroughs, and new access to information, constantly change the boundaries of feasible technical progress in farming, and the cost and likelihood of different sorts of advances.

The CGIAR is the international agricultural research system with most effect on developing countries. Its funding has not improved since the early 1980s, while the number of member institutions reliant on its support has risen. Large and fast-growing proportions of CGIAR resources have been diverted from producing higher-yielding, less extractive and more robust germplasm towards new environmental and social goals,⁷⁰ yet the donors have failed to provide resources commensurate with such goals. (For example, the long-term experiments, needed to test environmental impact and sustainability of alternative varieties, farm systems, or watershed management, require

longer-term and more resources than standard varietal trials). Research managers' ability to plan, or to move money where scientific success is most likely, has been further reduced by the growing propensity of donors to tie funds to particular goals. Despite continuing good performance and high rates of return, the CGIAR institutions have, under these conditions, been less and less able to compete with expanding private-sector research (especially biotechnology), and thus to keep sufficient leading scientists in institutions directed mainly to poverty reduction.

The CGIAR in the 1970s and early 1980s effectively advanced the concerns of the rural poor despite the tendency of much science and technology to serve the interests of the rich. The power of the CGIAR to do that is under threat. Renewed funding growth to meet new tasks is essential - as is a clearer focus on those tasks, a reversal of the tendency to tie them into special projects, and integration between bio-agricultural and land-water research and innovation. The most important issue is how donors, foundations, the CGIAR and developing-country NARS can work with private-sector researchers. If poor people's needs are to be met, biotechnology has to be redirected from its focus on the needs of the rich, and integrated into the environmental and food-safety concerns of developing countries. This can be done only with the cooperation of, and incentives to, the private companies involved, some of which realize the dangers, even to themselves, of their present isolation from the needs of the poor. Some are willing to contribute to remedies (in 2000 developing-country researchers obtained free seeds of provitamin-A-enhanced rice for crossing and trials; and Monsanto gave its working draft of the rice genome to the international public-sector group involved in this research). However, a wholly new public-private partnership is required. Such a partnership should: be led by the CGIAR (connected via its secretariat with both FAO and

the World Bank); involve agricultural donors such as IFAD, using its experience of participation to discover and respond to the requirements of poor farmers, workers and nutrient consumers; and be mediated principally by developing-country scientists and economists.

We make no apology for discussing these institutions of international agricultural technology beside the local, immediate needs of the rural poor. Not only are many of these issues inherently international, so the welfare of the poor depends on their effective voice in agricultural technology institutions; but also, if the institutions continue to lose funds and freedom of action, and (to the private sector) both key staff and access to information, basic inputs to NARS will be missing. NARS will not recover, or in many areas even acquire, capacity to stimulate growth in yields or rural employment. If biological and land-water technologies fail to improve, rural poverty reduction will be slow at best.

Such improvement depends at least as much on NARS as on international research institutions. NARS in Latin America, sub-Saharan Africa and some of Asia have shown funding declines in real terms since the 1990s. Yet India, China, Brazil, Mexico and South Africa – with substantial world-class (bio)technology capacity that is responsive to the requirements of the rural poor – contain, between them, most of the world's rural poor. Many others inhabit agroscientific middle powers such as Indonesia, Kenya and Sri Lanka; the falling cost of transgenics, once a gene is identified, allows such countries to test and monitor

these options themselves, provided they are not patented. But many rural poor inhabit countries with severely underfinanced research systems; some have proud research traditions and achievements, but through lack of resources cannot follow their research through;⁷¹ and in others there is effectively no research capacity at all.

Last but by no means least, we have said little about extension, the importance of which we fully recognize. The potential returns to investment in agricultural extension are high, but unfortunately the responsible organizations are frequently weak or politicized with poorly motivated staff and serious gender and other biases. Similarly, complementarities with research⁷² are frequently inadequate. It should be recognized that extension is a pipeline. If congested, it slows down the transmission of research, harming the poorest most, but is unlikely to prevent farmers from eventually selecting the technology that suits them best. In other words, the issue is, first, refilling the pipeline with innovations that suit farmers' needs and are useful for the poor; and second, ensuring their access to relevant inputs. IFAD has been instrumental in supporting moves towards more participatory extension methods; it initiated Lesotho's Client Demand System (replicated in Cameroon and Haiti), by meeting client preferences for technique and location. But for any extension strategy – and indeed for empowerment as a whole – to achieve the desired results, it will have to be matched by renewed progress in the techniques that really matter to the poor: techniques that turn their power over land and water sustainably into output, employment and income.

- 1 Their sustainability benefit derives mainly from reducing the further spread of farming into marginal land, which in their absence would have been essential to feed growing populations. To do this at constant levels 'if world crop yields had not been tripled [in 1950-92], we would have ploughed 10-12 million square miles of additional uncultivated land' (Avery 1997).
 - 2 Evenson and Kislav 1976.
 - 3 Fan *et al.* 2000a, b.
 - 4 Lele 1992.
 - 5 We use this term interchangeably with 'transgenics' (insertion of a gene obtained from one species into another) and 'genetic modification'.
 - 6 Conway 1997.
 - 7 Nuffield Foundation 1999; Brazilian Academy *et al.* 2000.
 - 8 Rosegrant and Hazell 1999.
 - 9 Hazell and Haggblade 1993.
 - 10 Lipton 1998.
 - 11 Avery 1997.
 - 12 See Lipton and Longhurst 1989; Kerr and Kohlavall 1999; Hazell *et al.* 2000. Typically of perhaps 80% of the hundreds of high-quality studies cited in these sources, Hossain (1988) reports from a sample of 639 farms in Bangladesh that those operating below 1 ha allocated 52% of land to modern varieties, as against 45% on 1-2 ha farms and 42% on larger farms. Farmers owning below 1 ha devoted 42.3% of cropped area and 51.7% of rice area to rice HYVs, as against respectively 32.5% and 42.4% for owned farms above 2 ha. Fertilizer use per hectare of cropland on below-1 ha operated farms was 33% higher than on farms above 2 ha; yield was also more, despite less access to irrigation.
 - 13 Singh and Byerlee 1990; Lipton and Longhurst 1989; Hazell and Ramasamy 1991.
 - 14 By the early 1990s, an extra million rupees spent on agricultural research (overwhelmingly biological) for irrigated areas in India produced an expected reduction in the numbers in poverty of only 0.76 persons per year - despite a rise in gross farm output of 4.4 million rupees, of course far less net of extra inputs of fertilizer, etc. Outcomes were much more favourable in some, but not most, rainfed areas (Hazell *et al.* 2000: Tables 6-7).
 - 15 The shift of land to grain for feed. To provide a given calorie intake per person requires some 3-7 times as much cereals land if the cereals are filtered through cattle, rather than eaten by humans direct (Delgado 1999).
 - 16 The CGIAR, founded in 1972, comprises leading international institutes for research on tropical and sub-tropical food crops (e.g. IRRI and CIMMYT) and livestock, plus some 'topic' institutes (e.g. food policy, irrigation management) and some regional institutes.
- The Secretariat is shared between the World Bank and the Technical Assistance Committee at FAO, with main financial and technical responsibility respectively.
- 17 IITA in Nigeria shifted from developing cowpea varieties for maximum monocrop yield because African farmers prioritized mixed cropping and fodder (Kingsbury pers. comm.).
 - 18 Hazell *et al.* 2000; Fan *et al.* 2000a, b; Boyce 1987; Lipton and Longhurst 1989.
 - 19 GM crops have spread from 1 million hectares in 1995 to 40 million hectares globally in 1999; some 60% of foods in US supermarkets contain them, with no known or recorded case of health damage. As with health, environmental risks are the same in principle as with other new plants (e.g. insect-resistant varieties can harm non-target insects), but GM crops are more carefully tested and screened. GM can be steered to increase biodiversity (e.g. the genetic similarity of many IRRI-based rice varieties has impaired field diversity, which should be increased following the insertion in 1999 of a dwarfing gene from wheat into rice). Environmental and health impacts of all introduced plants and foods should be screened, but potential benefits should be measured against risk (Nuffield Foundation 1999; Brazilian Academy *et al.* 2000; Lipton 1999).
 - 20 On micronutrient deficiencies: FAO 2000; SCN Special Commission 2000. On iron-zinc-enriched non-GM rice: IRRI Press Release, Dr. R. Cantrill, 22/5/2000. On Vitamin A GM rice: Ye *et al.* 2000.
 - 21 Hence 'do both' is unlikely to be a feasible way forward, even if funding constraints are somewhat relieved. Worryingly, the structure of international agricultural research (e.g. maize and millet are 'mandate crops' for independent institutions, respectively CIMMYT and ICRISAT) renders such choices hard to strategize or implement.
 - 22 In crop/agronomic research to save water, an outstanding exception is IRRI's work in India, China and the Philippines on management to maintain rice yields under greatly reduced water use (IRRI 2000: 30-1).
 - 23 Jeyaratnam *et al.* 1987.
 - 24 Cockcroft 1997.
 - 25 The main contribution of GM to pest management so far - inserting a gene expressing *Bacillus thuringiensis* toxin into maize, soy and cotton - is single-gene, vertical resistance, intended to destroy as close to 100% of target pests as possible, and presumably as stimulative of virulent new biotypes as conventional breeding.
 - 26 Byerlee 2000; cf. Mosley 2000, Lipton 1988.
 - 27 Fan *et al.* 2000a: Table 6; 2000b.
 - 28 IRRI 2000: 6.
 - 29 These examples often involve mutual support between

- bio-agricultural research and ILMT. More fodder-yielding cover crop varieties encourage the farmer to stabilize hilly land because they improve browse for cattle.
- 30 Lipton and Longhurst 1989.
 - 31 Edwards 1995: 17 on Jamaica; IFAD/FAO 1999.
 - 32 Drinkwater 1991; Tapson 1990.
 - 33 Fairhead and Leach 1996.
 - 34 Young 1998.
 - 35 IFAD 1993.
 - 36 Kerr and Sanghi 1992; Hudson 1992.
 - 37 Kerr and Sanghi 1992.
 - 38 Binswanger 1991.
 - 39 IFAD 1992b.
 - 40 Shiferaw and Holden 1997.
 - 41 Lutz *et al.* 1998.
 - 42 Erenstein 1999.
 - 43 FAO 1998a.
 - 44 Findlay and Hutchinson 1999.
 - 45 Prathapar and Qureshi 1999.
 - 46 World Resources Institute 1992; Yudelman 1993.
 - 47 Prathapar and Qureshi 1999.
 - 48 Singh, G. 1995.
 - 49 On vegetative vs stone bunds: Klepe 1995, Young 1998. On vetiver fodder: Grimshaw and Helfer 1995, Osunade and Reij 1996. Katsina: IFAD 1992b: 41.
 - 50 Sidahmed 2000.
 - 51 World Bank 1992.
 - 52 FAO 1996.
 - 53 Xie *et al.* 1993.
 - 54 Seepage and percolation depend on soil permeability. WUE is around 70% in the Gezira Irrigation Scheme, Sudan, with impermeable soil. In Eastern India, rice irrigation reaches 85% WUE due to rock beneath shallow soils (Xie *et al.* 1993).
 - 55 Frederiksen 1992.
 - 56 Paddy water: Tabbal *et al.* 1992, IRRI 1990, Hazell *et al.* 2000, IRRI 2000: 30-1. Pakistan: Wolters 1992.
 - 57 Abate 1991.
 - 58 Xie *et al.* 1993.
 - 59 Wolff and Stein 1998.
 - 60 On sprinklers: Wolff and Stein 1998; IFAD 1993. On drip: Stockle and Vilar 1993; Postel 1992; IFAD 1999h; Abu Taleb *et al.* 1991.
 - 61 Xie *et al.* 1993. See Chapter 2 on ultra-low-lift and treadle pumps in Bangladesh - like bamboo tubewells in Bihar, India, also irrigation assets especially well suited for ownership, use and manufacture by the poor, whose main asset is labour.
 - 62 For example, farmer-specific metering or other irrigation charging is often infeasible (e.g. if water covers, and flows between, tiny paddies). Similarly, standpipes for several households are often far more cost-effective and affordable than individually metered drinking water. User consensus on sharing a group fee is then needed for efficient desubsidization, but usually obtainable only if the group has 'voice' in securing reliable water delivery.
 - 63 Thailand: van Vilsteren and Srkirin 1987. Bali: Horst 1996.
 - 64 Chitale 1991.
 - 65 A striking example is 'water mining' - the effect of deep tubewell pumping in lowering the water-table, rendering shallower tube-wells (usually used by poorer farmers) useless. If a deep tubewell is privately owned (which usually pays only on a single large holding - absent public ownership, or collective action by many nearby small farmers), it is very hard to prevent water mining by legally enforceable pricing. Equity and equality effects apart, water mining steadily raises costs of pumping and of new tubewells, and may exceed recharge and exhaust the groundwater. Yet publicly owned or cooperative tubewells have familiar and serious problems too.
 - 66 On Fayoum: Wolters 1992; conjunctive use: van Tuijl 1993; India: Chitale 1991; corruption: Wade 1982.
 - 67 World Water Council 2000: 64-6.
 - 68 IFAD 2000b.
 - 69 IFAD 2000b.
 - 70 Lipton 1999.
 - 71 For example, Ethiopia in 1996-98 widely introduced two successful maize hybrids under the GLO-2000 programme of the SASSAKAWA Foundation. Maize research, split among federal and provincial bodies, will surely be called on to deal with new pest biotypes that 'like' a new hybrid. Resources and leadership will be needed to respond swiftly - and such responses elsewhere have too often been slow or missing. The poor and remote then suffer most.
 - 72 Evenson 1999, 2000.

CHAPTER 5

EXPANDING CAPABILITY, REDUCING POVERTY: STRATEGIES FOR ASIA

Fundamental to the various strategies to reduce poverty is:

- *Changing unequal gender relations to increase women's ownership and control of property, and their effective participation in community management affairs.*
- *Enhancing the productivity of staples in less favoured areas.*
- *Reforming property rights of the various indigenous peoples.*
- *Expanding the capabilities of the poor and vulnerable through greater access to self-help, development, new skills and technologies.*

The Asia and the Pacific Region, particularly East and Southeast Asia, has been the world's shining example of outstanding progress in reducing rural poverty over the last two decades. But the region not only still contains two thirds of the world's rural poor; there are indications that the rate of poverty reduction has slowed down in many countries since 1990. In response to the millennium development goal of halving poverty in the world by the year 2015, many multilateral and bilateral donors have accorded high priority to poverty reduction. For example, the World Bank proposes to attack poverty in three distinct ways: promoting opportunities, facilitating empowerment and enhancing security. The AsDB, a major donor in Asia, intends to pursue economic growth, human development and sound environmental management, and improve the status of people in ways that will contribute most effectively to poverty reduction – its overarching goal.

In its *Rural Poverty Report 2001*, IFAD has argued that, to be successful, poverty reduction policies must focus on rural areas where 75% of the poor work and live and where more than 50% are expected to continue to do so even by 2025. It further emphasized that the rural poor need legally secure entitlements to assets (especially land and water), technology (particularly to increase the output and yield of food staples), access to markets, opportunities to participate in decentralized resource management and access to microfinance. It concluded that such policies will not only promote economic growth but would also help to alleviate urban poverty. It therefore called for a pro-poor policy environment and an allocation of a greater volume of resources targeted to the poor with greater effectiveness.

IFAD has had a unique experience of supporting women's SHGs, particularly in Asia. It has pioneered innovative partnerships with national and local governments, civil societies and local communities, for working with excluded groups of the poor such as women and various indigenous peoples. This report recommends a strategy for IFAD in Asia that promotes the broad framework of the IFAD *Rural Poverty Report 2001* but with a sharper focus on:

- redistribution of ceiling surplus land
- property reforms in the forest areas
- non-farm employment
- targeting on catalytic and marginalized groups such as poor women and indigenous peoples.

The report suggests a primary focus on the less favoured areas – the remote uplands and mountains, the marginal coastal areas and the unreliably watered drylands. From a social standpoint, it advises that IFAD should continue its strategic focus on women and indigenous peoples as entry points to a much broader programme in the years to come.

ENHANCING WOMEN'S AGENCY TO PROMOTE SOCIAL TRANSFORMATION AND AGRICULTURAL DEVELOPMENT

The largest concentration of poverty is in South Asia and this is also the sub-region that stands out for its startling inequality of gender relations. The extent to which IFAD and other international and national organizations are able to make an impact on poverty in the coming decades will depend on the extent to which they are able to alter gender relations in the countries and areas of poverty. There is strong evidence today that shows that enhancement of women's agency role is the key strategic policy to change gender relations and to rebuild societies with greater social and economic justice. The effect of such a policy extends beyond the household or the community of which it is part. Development literature also now recognizes the close connection between women's education and the elimination of the worst expressions of poverty – such as excessive infant and child mortality and morbidity, and low enrolment of girls at school. The impact of income on children's health depends not just on the level of income itself but also on the scope of women's decision-making role within the family.

There are many examples, from different parts of the world, of the transformational role of women (Box 10.1). Women's social transformational roles have also been observed in several IFAD-funded projects in Asia. The women's cooperative movement in Andhra Pradesh has been instrumental in changing the cooperative law of the state. The intrusive powers of the bureaucracy, which was one of the sources of weakness in

Box 5.1: Women can transform societies

The struggles of Argentinean and other Latin American women (Mothers against the Disappeared Ones) were instrumental in securing widespread human rights for their societies as a whole. The activities of the Self-Employed Women's Association (SEWA) and the WWF in India, the Grameen Bank in Bangladesh and many other women-centred NGOs has brought to centre-stage the role of the informal sector and women in development. They have transformed the definitions of 'employment' and 'trade union' and initiated many regulations that have improved the conditions of work and life in this vast sector.

Source: Jahan 2000.

Box 5.2: What women's agency can do: The IFAD experience

- In IFAD's Andhra Pradesh Tribal Development Project, SHGs of women took up contracts for local construction and, with the help of supportive bureaucrats, were instrumental in the elimination of contractors for such works in all tribal areas of the state. More recently, federations of SHGs in the project have taken on multiple functions in addressing social and administrative issues at the block and sub-division levels (Mascarenhas 2000). They have taken up issues like construction of toilets, repair of roads, improvement in drinking water and electricity supply.
- In the IFAD Maharashtra Rural Credit Project, women's groups took up numerous social issues once they had become well established. The curtailment of alcoholism was one. Other issues were to demand and force improvements in the provision of social services, like drinking water and bus services.
- In the IFAD Tamil Nadu Women's Development Project, women's groups in villages affected by extreme discrimination against girl children took measures to oppose female infanticide.

the old cooperative sector, have now been eliminated. This Andhra Pradesh law is now being extended to other states of India. At local levels too, the beneficial effects of unleashing women's agency are evident (Box 10.2).

In economic affairs, the external factor (entitlements from the state, banks, donor organizations, NGOs) has become more and more important. Many new IFAD designed projects target most funds through the communities. In some cases, the community spends such funds on village requirements and the men-dominated village committees largely determine this expenditure. When community decisions are made, it is men's voices that are heard. This is so even in matrilineal communities where, even if women still own land, community affairs are the monopoly of men.

Some countries, interestingly in South Asia, have taken legal measures to ensure women's representation in village committees. IFAD's own experience has been that in the first phase such representation of women tends to be largely nominal, although over time women do begin to exercise the powers they acquire through these committees. Studies of the experience of women's representation in village committees, including as heads of these committees, also show that, over time, women do exercise their powers. There are reports of less corruption in use of public funds and of more use of such funds for family, child welfare and education activities. **This is a strategy that needs to be promoted more pro-actively by IFAD and other international or national institutions.**

Women perform most of the unpaid work within the family; men are reluctant to share in it. At the same time, women's working hours are longer and more fragmented than those of men. The lack of leisure affects women's ability for self-development through the acquisition of new capacities. The fragmented nature of their work – the little bits of time spent on a multitude of tasks – means that their concentration on a given task, important for developing innovation skills, is also limited. Thus is women's ability to innovate constrained. If women are to be innovative and far reaching agents of change, particularly in the remote and marginal areas of Asia, greater provision must be made for more effective support services for women.

In seeking to transform gender relations to build a strong base of norms that promote poverty reduction, one needs to look at interventions that can have ripple effects.

■ *The concentration of the burden of unpaid work on women, the lack of social provision for the same, and the absence of burden-sharing all restrict women's potential to develop their capacities in various fields.*

Microfinance is one such example of a strategic gender intervention with effects across many areas of women's existence. It is a successful innovation in enabling assetless women to obtain access to rural finance services, an important innovation with which IFAD has long been associated. Poor women's demonstrated ability to repay loans at high (20% or

so) rates of interest also shows that it was only a gender-based market distortion, related to non-ownership of collateral assets, that prevented poor women from getting credit.

The positive effects of microfinance are today well acknowledged. A study by Hashemi et al. (1996) suggested that "women's access to credit contributed significantly to the magnitude of the economic contributions reported by women, to the likelihood of an increase in asset holdings in their own names, to an increase in their exercise of purchasing power, and in their political and legal awareness..." Furthermore, access to credit was also associated with higher levels of mobility, political participation and involvement in 'major decision-making' for particular credit organizations.

Microfinance does however have some limitations. Women's control is greater mainly in homestead-based activities:

- Lower productivity compared to men's economic activities.
- Violence by men in response to loan repayment problems.
- Men's control over investments in larger-scale investments and in new sectors.
- Accumulation generally centralized in NGOs.

It must also be reiterated that the transformational role of microfinance has occurred in the context of cultures traditionally stressing the virtues of women's seclusion and lack of property. The limitations of the microfinance schemes, particularly the difficulties faced in women's controlling credit that is not used within the household and is used in higher-income earning activities, point to the necessity of paying attention to the 'second-generation' problems that successful microfinance schemes have brought up. Further, men's resistance through violence, which seems to be stronger in the initial stages and more muted later on, needs to be addressed.

The positive impact of microfinance on women's mobility, and in dealing with the market and officialdom, may also be quite strong in an area with strong restrictions on women's mobility and external dealings (as in South Asia). But a similar microfinance scheme may not have the same social impact in Southeast Asia, which has a long history of women dealing with household economic affairs and the market. In fact, reports on the P4K and other microfinance schemes in Southeast Asia have pointed out that Southeast Asian credit groups, unlike in South Asia, tend to have only economic functions. The reason may be that the social questions of seclusion and non-dealing with the external, economic world are not factors in gender relations in Southeast Asia. Thus the

potential of microfinance schemes to transform gender relations may be more location specific – much more in South Asia than in Southeast Asia.

But instruments such as microfinance must not be blindly promoted. They must not overshadow the more fundamental issues of women's weaker chances to build assets – human capital (schooling, health nutrition, even survival prospects) and physical assets such as the ownership of land and other productive assets. This capability deprivation of women explains their restricted chance to escape poverty or to find 'exit options' from home or work situations. The experience of East and Southeast Asia has shown that drastic poverty reduction can be achieved through early gains in agricultural productivity, employment and incomes, followed by increased growth and employment in the non-farm sector. South Asia, and indeed all the less favoured areas of the region, will be able to bring about dramatic poverty reduction if the existing unequal gender relations are fundamentally changed so that women have ownership and control of property and effective participation in community management affairs. There is also a need for a stronger attempt to increase their access to new technology and to empower women with new and emerging technological skills suitable for the challenges of the less favoured areas.

In formulating strategies for reducing gender inequality we need to take into account the enormous sub-regional disparities, both within the three sub-regions (South, Southeast and East Asia) and within the three sub-regions and countries. There are differences in this regard in women's dependence on agriculture and in the social constraints they face. For instance, according to ILO figures, the percentage of women workers is as low as 15 in Malaysia and as high as 93 in Nepal with Indonesia and Thailand coming in-between with 50-60%. It is precisely by examining and explaining such variations that we can find illuminating answers and formulate relevant policies. For example, in countries like India where agriculture is still the primary source of livelihood, enhancing women's land rights and land productivity could be critical for reducing gender-based poverty. Where agriculture is a marginal source of livelihood other strategies would be needed.

In regions where agriculture dominates livelihoods, land is extremely important for women for reducing the risk of poverty and enhancing food security. Land also increases aggregate wage rates and access to credit. And an increasing range of econometrically robust studies show that property and asset ownership by mothers has significantly better outcomes for child survival, education and health, than those owned only by fathers (see the long discussions in Agarwal 1994 and 1997). Education needs to be seen in inter-generational terms. Hence even to promote female education in the next generation, it would be strategic to create immovable assets in adult women's hands in this generation. And independent land access would enhance women's agency.

Similar attention must be paid to women's access to forest and water resources. For instance, under the JFM programme launched in India in 1990, largely-male village committees have taken some role in local forest management, leaving women with little say in decision-making and with few options for daily needs of firewood and fodder or forest-based livelihoods.

■ *Where agriculture dominates livelihoods, land for women is extremely important in reducing the risk of poverty and enhancing food security. Land increases aggregate wage rates and access to credit. An entire range of studies show that property and assets owned by mothers mean better outcomes for child survival, education and health, than assets owned only by fathers.*

However, for getting agricultural land in particular, women will need to explore all avenues. So far almost all government schemes – land reform, resettlement, anti-poverty – have tended to give land to male household heads. This needs rectification. But equally, land via inheritance is especially important, since in countries such as India most arable land is in private hands, and much of it passes down via inheritance. This is not just a legal issue; it is a question of reg-

istering women's claims at the village level and helping women make productive use of land, with access to both investment funds and extension services. SHGs could help in this process. In addition, it is necessary to explore avenues of land via the market. Some NGOs have helped poor women's groups to purchase or lease land using government-subsidized credit. Rural credit could also be used in this way, though the promotion of credit thus far has done little in this direction. Women could also be enabled to get use rights with secure leases to government-owned resources, like fishponds on government lands. This again needs to be backed up by SHGs, microcredit, and extension services, to enable women to undertake the intensive aquaculture possible in pond aquaculture.

Basically, in South Asia and Southeast Asia, where women's dependence on agriculture and land-based resources is high, women's access to arable land and to commons needs to be seen as a critical element in a diversified livelihood system. But it is also necessary that rural development programmes go beyond a focus on changes in women's access to economic resources, education, and so on. Patterns of other kinds of relations within the family need to be tackled, in particular the question of domestic violence. Violence against girls, including incest, has appeared as a frequent precursor to entry into the commercial sex sector (Farley and Kelly 2000). The self-esteem of such girls is very low and programmes need to address this phenomenon.

Trafficking of girls, often with the connivance of family members, is the gendered response to the lack of livelihood options, combined with factors such as the oppressive nature of familial relations. A rural development programme needs to include the elimination of child labour, including – within the ambit of child worker – girls of school-going age who are out of school in order to perform unpaid domestic labour, including care of younger siblings (Burra 2001). A programme of compulsory primary/middle school¹, with appropriate incentives and social provisioning of services like childcare is necessary to handle the problem of child labour – and of child prostitution. "Evaluation results demonstrated that basic education and vocational training are among the best strategies to prevent girls from entering the child prostitution industry." (UNAIDS 1999, quoted in Rice and Farquhar 2000).

One of the most critical emerging problems is the threat of an HIV/AIDS epidemic in Asia (Box 10.3). What is needed is a rural development programme that addresses

Box 5.3: Asia and the AIDS threat

While the world's attention has justifiably been focussed on the ravages of AIDS in Sub-Saharan Africa, the disease is spreading at a faster pace in Asia than in Africa. Since 1994 the rate of HIV incidence has more than doubled in the Asian Region (Joint United Nations Programme on HIV/AIDS (UNAIDS) statement in Indian Express, 22 October 1999). Epidemiologists expect that Asia will be the next epicentre of the HIV/AIDS pandemic (FAO and UNAIDS 1999). A number of Asian countries – notably Cambodia, Myanmar and Thailand – have infection levels that qualify as epidemics. India is now the country with the largest number of HIV-infected persons in the world. Parts of China and India (the states of Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra and Manipur) already have epidemic levels of HIV infection.

the underlying factors of vulnerability from an HIV/AIDS perspective (FAO and UNAIDS 1999). Human vulnerability, however, has to be analysed from economic, social and gender-specific perspectives. Within each country it is necessary to identify the 'labour supply' rural regions, both for women/girls in the commercial sex sector and for men/women in the lower rungs of the working class, including the informal sector. These labour supply regions are largely those of the drylands and mid-mountains, the single crop economies, subject to the periodic ravages of drought and flood.

To combat the spread of HIV, the primary focus of a rural development organization must be maintaining the development of landless women, and other landless and rural poor. It must include within its ambit the abolition of child labour (both waged and unwaged) and universal education, while integrating sexual health issues into rural health delivery systems, and attempting to change gender relations in general.

DEVELOPMENT OF THE LESS FAVOURED AREAS

In the past, development strategies have tended to concentrate on irrigated and high-potential areas to expand food supply, stimulate growth and reduce poverty. This strategy had impressive success in triggering off the Green Revolution in many Asian countries. But it also resulted in the neglect of less-favoured areas – where a large proportion of the rural poor live. It has now been estimated that 40% of Asia's poor live in less-favoured areas,² and this rough estimate is supported by more precise estimates for India and China (Rosegrant and Hazell 2000).

Despite outmigration to areas of more rapid growth, the population in these less-favoured areas has grown. But this growth has not been matched by yield increases, and as a result, there has been increasing poverty, accompanied by widespread degradation of natural resources (soil erosion, deforestation and loss of biodiversity) through the expansion of the cropped area. This by itself is justification for redirecting development resources to these areas. The argument is further reinforced by the highly favourable production effects and the absence of a trade-off between poverty reduction and higher production in these resource-poor regions.

A study based on Indian data (Fan and Hazell 2000) focused on two important features: the disaggregation of infrastructure and the computation of impacts (direct and

Box 5.4: High impact in low-potential areas

The districts were divided into irrigated, and high- and low-potential rainfed areas. The findings showed that total factor productivity (TFP) growth had slowed in irrigated areas, from nearly 3% per annum during the 1980s to a little over 2% in the 1990s, and that it had remained unchanged at about 4% for the high-potential rainfed areas. However, TFP accelerated strongly in the low-potential rainfed areas, from about 1.5% in the 1980s to about 3% per annum in the 1990s.

indirect) of different types of infrastructure and technology on production and poverty. The study (Box 10.4) found, for example, that roads not only contribute directly to agricultural production but also influence the adoption of high-yielding varieties and investment in irrigation, variables that in turn also have an impact on agricultural production. Further, technology and infrastructure variables have an impact on rural poverty (i.e. the headcount index) through their effect on agricultural production, wage rate and terms of trade. The study concluded that for every investment, the highest marginal impact on production and poverty reduction occurs in the rainfed areas, while irrigated areas rank second or last. Moreover, many types of investments in low-potential rainfed areas yield some of the highest production returns, and all types of investments except markets and education have some of the most favourable impacts on poverty.

The study did not, however, explicitly consider differences in the costs of providing infrastructure in different types of areas. For example, building roads is more expensive in remote mountainous areas. The issue then is whether or not the evidence conclusively favours channelling a larger share of public investment to low-potential areas. There is some evidence from India that suggests that the unit costs of providing infrastructure are similar across states, notwithstanding the considerable diversity in the proportions of irrigated and rainfed areas. There is also some corroborative evidence from China that shows that the returns to extra agricultural research and development in the poorest (western) region are 15% above the country average. Estimates indicate that 140 people are brought out of poverty per CNY 100 000 of extra research investment in the poorest region, as against 34 nationally (Fan et al. 2000). An even more careful assessment is needed to make a more firm case for favouring low-potential areas. But the case certainly has legitimate claims on the basis of present evidence – that the potential of larger investments in such areas, for poverty reduction as well as production returns, cannot be underestimated or overlooked. These results thus confirm the potential and workability of the current emphasis of IFAD-funded projects in remote and less-favoured areas.

As household food security and malnutrition are still major concerns in these areas, technologies that revive staples productivity growth – especially of indigenous and non-tradable local staples – must be more vigorously researched in an open and publicly-controlled science environment. Pro-poor researchers need to have a deeper understanding of the knowledge base of local communities to enhance the productivity of staples. But the poor in these less-favoured areas also need to be better informed in their judgements of the new technical change in seeds, fertilizers and land-water management

aspects through more regular open interaction with outstanding pro-poor scientists in the relevant topic areas. IFAD's current collaboration with international and national agricultural research needs to move into this area in the coming years, but the design of this collaboration must be with farmers, farm workers and consumers. Due to diversion to industrial and domestic uses, as well as higher evaporation rates and less stable rainfall patterns due to global warming, Asian agriculture is likely to face a water squeeze in the near future. IFAD will support the development of water management techniques that can improve water use efficiency and raise the economic efficiency of water. In the hills and mountains, low cost, gravity fed technologies in sprinkler and drip irrigation will be promoted for horticultural development.

■ *The synergies between the farmers' own practice and research and frontier formal research must be tested and used where feasible to reduce poverty.*

REDUCING POVERTY BY ENHANCING THE ROLE OF INDIGENOUS PEOPLES

✓ The upland and mountain areas are inhabited by indigenous peoples currently afflicted by the most endemic and intractable poverty. The economic and political marginalization of these regions has also meant that little attention has been paid to the needs of the poor in these areas. Indeed there has been practically no investment in these areas from the international financing institutions except for IFAD. The financial requirements and the potential of the indigenous peoples and their habitat are enormous, and well beyond the capacity of IFAD. However, IFAD-supported projects could demonstrate the usefulness or otherwise of different kinds of approaches to poverty reduction, in the hope that these experiences will help persuade governments to make necessary changes in their policies.

✓ There is a growing awareness among the public and specialists that the historical marginality of these areas may largely be a function of ignorance as to the magnitude of their true worth. Also, the implications of the continuing and intensifying loss of wealth represented by their bio-diversity status are only just beginning to be appreciated, and the costs of upland, hilly area and mountain degradation in global terms (rainfall variation, flooding and air quality) just beginning to be recognized.

✓ Although their soils are marginal, the uplands of Asia offer huge opportunities for economic development on other fronts: as sources of water, power and biological diversity, valuable minerals and a wide variety of indigenous forest and agricultural products. It is indeed unfortunate that the residents of the areas have not benefited from past efforts to exploit their natural resources. Opportunities for investment include forestry and agroforestry, harvesting of medicinal plants, and environment-friendly production of high-value products such as organic foods, morels and fine wool. And the uplands and mountainous regions of Asia have some of the world's most pristine settings, eminently suitable for ecotourism. IFAD's experience in the upland areas of Asia shows that, provided the projects are carefully designed and effectively implemented, on-farm productivity and forest and tree production can be increased by as much as 30% (FAO 1999).

✓ Among the most important assets in the upland areas are the forests and their biological diversity. Indigenous peoples have traditionally had intimate knowledge of these rich resources; yet their stewardship of biodiversity, and their skills and interest to manage, are seldom recognized. If poverty reduction is our goal, then the urgent need is to reform the system of ownership of the forests and make them the property of the forest dwellers. Given that forest dwellers are the most disadvantaged in virtually all Asian economies, this property rights reform would produce "the greatest benefit of the least advantaged" (Rawls 1972).

✓ The type of property rights reform proposed is an asset transfer, not an income transfer via taxes and subsidies. Redistribution of forest ownership would link income with labour and investment in producing the necessary ecological and other forest goods for sale. It would be both more just than the present system of coerced extraction of these goods and services and is likely to increase productivity by providing incentives for increased supply.

✓ Reform of forest ownership could be along the following lines:

Forests must be owned and managed by the local communities. Ownership means the right to sell forest products (timber and NTFP) and ecological services, as well as the right to manage the forest, including determination and amendment of the land-use system.

- Locally important forests (critical natural capital) should be set aside as communally owned reserve forests, with appropriate restrictions on extraction to preserve important ecological service functions.
- Forest owners should be allowed to sell the ecological services they provide for regional, national and global needs.
- Rights to forest income and to participate in forest management decisions must be restricted to those residing in the village and contributing labour.
- The right to forest income is not to be saleable.
- The forest itself should not be saleable. This means it is not to be real estate but a means for labour and supplementary investment.

Combined with the reform of property rights in the forest, a programme is suggested along the following basic principles:

✓ Promotion of regenerative agriculture and forestry.

- Export of high-value organic foods and NTFP.
- Transformation of gender relations to emphasize women's control of resources and their involvement in household and community decision-making (design and implementation to include strong participatory gender analysis).
- Focus on local institution building through a process of participatory learning and networking.
- Mobilization of local knowledge and cultural traditions of experimentation, using indigenous technical knowledge as the starting point for blending local and new technologies, especially where resource pressures are high and traditional practices need to be adapted accordingly.
- Systematic and widespread use of participatory techniques, including participatory monitoring and evaluation.

Based on experience to date, IFAD's view is that the following seven aspects are critically important to the success of such a programme:

✓ **Reversal of deterioration in the productive potential of the uplands.**

- Diversification of local economies.
- Identification of niche markets.
- Creation of locally based microfinance services.
- Creation of appropriate basic rural infrastructure.
- Local institution building to support good governance, and the community-based and gender-balanced management of natural resources.
- Human resources development, with a strong focus on strengthening women's position both in the home and in the community.

The deterioration of the productive base would be addressed in the context of a series of locally defined and implemented policies that give local communities secure user rights over their natural resources, including forests and water. This would allow them to incorporate externalities (e.g. logging, hydropower schemes), not accounted for at present, into their resource-management decisions. The fact that the environmental services the uplands can provide will cease to be free, both regionally and globally, will contribute significantly to their sustainable conservation and also provide compensatory income to the local populations.

The Asian crisis has clearly demonstrated that 'diversification' cannot be reduced to the export of labour because migrants will return or cease to remit in difficult times. IFAD should therefore promote the development of an authentic diversity of complementary production systems within local economies. The promotion of 'agro-ecologically sensitive' regenerative farming, livestock, forestry and agroforestry systems would be associated with support for the exploitation of vertical and horizontal links in processing, trades and services, on the part of small and micro enterprises.

A crucial ingredient for successful diversification is the availability of banking services suited to local economic parameters, namely microfinance. Indeed, the availability of savings and microfinance has allowed people throughout the region to bridge times of crisis and adjust their operations. Support for the development of microfinance facilities, based primarily on local capital formation and directed to investments in the local economy, would therefore be an important factor in efforts to increase the resilience of the poor, and especially women, to external financial and economic shocks.

Time and again experience has shown that gains from agriculture, forestry and off-farm income-generating activities cannot be fully achieved, or sustained, in the absence of basic appropriate rural infrastructure such as feeder roads, bridges, water management and conservation works, and small-scale production plants. For example, studies conducted in Laos have shown that households without market access are more likely to be poorer than those with better access (World Bank 1995).

The specificities of the upland areas and their populations call for innovative implementation arrangements. In view of their remoteness and diversity, priority should be given to the development and application of decentralized, participatory and iterative

Box 5.5: Developing local capabilities

- Individuals must be trained and educated in the knowledge, skills and attitudes needed to create and manage their economic activities and their community-based institutions, whether these are savings and credit groups, farmers' associations, or women's organizations.
- The promotion of women is central to institution building and human resource development. The more gender-balanced social and cultural systems of upland societies are changing rapidly. And experience indicates that enabling women – building on their motivation, knowledge and skills – means increased well being for children and the family. Indeed it means the increased economic resilience of the poor.

■ *The disruption of earlier forms of economic production, the blocking of new avenues of investment, the glorification of new 'masculinities' and the disruption of community organization all combine to create conflict in community life. Attempts to resolve insurgencies must address the fundamental conditions of economic exploitation and social exclusion that underlie such conflicts. Peace must eliminate the structures that support unequal capabilities – and power – within or between countries, and between men and women.*

approaches to design and implementation (Box 10.5). This would ensure both sensitivity to local conditions and increased commitment on the part of the beneficiaries, enhancing the sustainability of results.

Although the core elements would remain inspired by environmentally sound development, every effort should be made to link the vast potential of the upland areas with international and domestic markets. Just as essential as social concerns are the identification of marketable products, and suitable technologies to exploit their possibilities. Taken together, the two aspects provide the basis for enhancing incomes on a sustainable basis.

ENHANCING PEACE FOR POVERTY REDUCTION

In a continent of rising inequality and persistent poverty in a significant number of countries and rural households, various forms of exploitation and social injustice will continue to thrive, eventually leading to conflict and insurgencies. Alarming, such conflicts are already to be found in many of the Asian countries. The breakdown of the social capital of communities and the blatant disregard of human lives on both sides of the warring groups are matters of great concern in many IFAD-supported project areas. The disruption of earlier forms of economic production, the blocking of new avenues of investment, the glorification of new 'masculinities' and the disruption of community organization all combine to disrupt community and family life. Formerly simple acts of production and trade become heroic acts. The fish trader in Mozambique who "walked across terrifyingly dangerous parts of the war zone to trade his tiny cache of fish became a monumental figure because his gesture said that normal community life was in fact possible." (Lutz and Nonini 1999). Simple tasks – sleeping at night, saving one's crops from confiscation (often from both sides) or setting up various forms of community and family life – all become major tasks in the new war zones.)

There have been attempts to resolve some of these insurgencies by holding 'peace talks'. But these can yield results only if they deal with the fundamental socio-economic conditions of economic exploitation and social exclusion that underlie the insurgencies. And peace cannot be simply the absence of conflict or the elimination of fear of physical violence. That would be a 'negative' and insecure peace. To be 'positive', peace must eliminate the structures that support unequal capability fulfilment within or between countries (Brock-Utne 1989) and redress the wrongs done to all those involved in unequal power, including gender relations. Rather than a return to the *status quo*, a positive peace must include the promotion of social justice, human rights and the elimination of unequal power and development relations. If the millennium development goals are to be a reality by 2015 in Asia – the continent with overwhelming numbers of the poor – then a rights-based approach to development must become one of the distinctive features of a pro-poor strategy. This is another area in which an international development agency like IFAD can do its bit to foster a just peace and development for all in Asia.

Endnotes

- 1 "Overall, there is enough evidence to show both from outside and from within the country [viz. India] itself that the incidence of child labour is considerably lower in areas where the proportion of children going to school is high" (Shantha 2000, 170).
- 2 According to a report prepared by the Technical Advisory Committee of the Consultative Group on International Agricultural Research, 550 million ha of land currently used for agricultural purposes in Asia can be classified as marginal and another 340 million ha are sparsely populated arid lands. In contrast, there are only 305 million ha of high-potential or favoured land. Of the 633 million rural poor in Asia in 1988, about 263 million (40%) lived in the less-favoured areas.

CHAPTER 6

ENDING RURAL POVERTY: CHALLENGES AND OPPORTUNITIES

Poverty reduction is not something that governments, development institutions or NGOs can do for the poor. The poor themselves have to seize responsibility, as agents of change, for their own development.

The 20 years between 1970 and 1990 saw the fastest and most widespread retreat of poverty, hunger, premature death and illiteracy in history. Most of those affected were the rural poor of the developing world. However, large rural areas, containing hundreds of millions of people, remain trapped in poverty; since 1990 its retreat has been much slower. This report has explored the nature of the rural poor; who they are; where they are; what accounts for the successes, gaps and failures of rural poverty reduction; and what can be done about rural poverty and by whom.

A global report on rural poverty is not the place for policy advice to any particular country. Each chapter has set out conclusions about needs for better policy, and about types of policy that work or fail in specified conditions. But some themes have emerged from the analysis, which underlie policy and have operational implications.

EMERGING THEMES AND CHALLENGES

The nature of rural poverty and the inadequate response

Most of the world's poor are rural, and will remain so until at least 2035. The urban-rural gaps in poverty, health and literacy are large and, on the

whole, not narrowing. These gaps are not only unjust but also inefficient: shifting resources, assets and access from urban to rural, and from rich to rural poor, often advances economic growth. Now that most donors and developing countries are reorienting their policy towards poverty reduction, one would expect investment and aid to concentrate substantially on the poorest countries, and on support for agricultural and rural activity. Yet this is not the case; for example, in 1988-98, aid to agriculture fell by almost two thirds in real terms.

The poor themselves report distress that stems not only from low consumption but also from ill-health, lack of schooling, vulnerability, lack of assets and disrespect from officials. Those who suffer from one of these conditions tend to suffer from others as well. Disproportionately many are rural women, ethnic minorities in remote areas, landless, casual workers, or children: poverty and lack of education are inherited conditions. Breaking the 'interlocking log-jams of disadvantage' may require attacking several barriers. For example, we document shocking educational disadvantages among the rural poor. To address these, more nearby schools and teachers are needed, but

so are better health and nutrition. Lack of these human assets stops children from learning, compels parents to send them to work, and perpetuates poverty.

Fertility decline and the dramatic rise in worker-dependant ratios in 1990-2030 can help the poor to escape poverty, if the extra workers can find decent work. This was achieved in East Asia through early gains in farm yields, smallholder incomes, and hence farm employment – soon followed by increases in employment and growth in the non-farm sector. South Asia and Africa can follow this path if their agricultural and rural policies can be set right, and if right policies can be translated into favourable outcomes in terms of the assets and opportunities of the rural poor at the local level and their livelihoods.

Women's disadvantage and exclusion in education, landholding and, in some countries, nutrition and health care reduce their security and esteem; in some countries they slow the fertility transition. These disadvantages are greater in rural areas: they can be reduced by redressing the under-allocation of rural resources.

Poverty and asset policy

The extreme poor spend almost three quarters of their income on food. They receive over two thirds of their calories from staples, and earn perhaps half their income from growing them. So the control of farmland by the poor tends to be a safeguard against extreme poverty. 'Classical' land reform has transferred more land, and with more success in reducing poverty, than is widely believed; but it has run into many problems. Consensual and decentralized land redistribution is a promising way forward, with the largest farmers attracted to sell land in small amounts to the poor; but it requires some land fund in support. This is in tune with the policy preferences of many donors, recipients and civil-society organizations,

as well as those of many of the poor. However, especially with the new requirements of global markets, post-reform smallholders require access to competitively marketed inputs and services and to research, roads and other resources that normally only governments can supply.

Water-yielding assets are also increasingly important to the rural poor as more areas are affected by water scarcity and diversion. Removal of water subsidies is desirable, but caution has to be exercised against further transfers of water away from rural areas, which will endanger the already inadequate farm water control (and drinking water) of the rural poorest.

The heavy biases against rural people, the poor and women in acquiring 'human assets', especially health and education, are inefficient as well as unjust, and in most cases not shrinking. Reducing these biases, and providing the poor with access to land and improved farm technology, are complementary; each increases the economic gain and poverty reduction from the other.

Technology policy, poverty, and natural resource sustainability

The value of human, land, water-yielding and other assets depends on the technologies that turn those assets, together with labour, into adequate incomes. The poor's shortage of assets compels them to live mainly by selling their labour-power. So increasing the market value of that labour-power, through choices in asset-building and in technology that are employment-intensive, is vital for poverty reduction. But subsidies to farm equipment, such as combine-harvesters and weed-icides, displace human labour and ultimately harm the poor. There are also positive requirements of pro-labour policy. If the poor have some farmland, their bargaining power in labour markets is increased. Agricultural researchers need to perceive that the use of labour itself, while a cost, has social advantages for poverty reduction.

Rural technologies face two tasks: to reduce poverty through more and better distributed output and welfare; and to improve resource sustainability. On the whole, the former has been best achieved by bio-agricultural research, and the latter by improved land and water management technology. The two are strongly complementary, though separated by fashion and by barriers between researchers and institutions. Poor farmers can seldom afford to buy into conservation technology unless there is a production gain. And all types of formal research are complementary with farmers' own research and succeed best with participatory methods. But the lack of progress in the spread of water control (especially in Africa) and the slowdown in historically fast rates of food-crop yield improvement are serious causes for concern. The stagnation or decline in many areas of public agricultural research must end. The increasing locking-in, or patenting, of agricultural research results by a few private companies, with few incentives to structure their work towards the needs of the rural poor, has to be replaced by appropriate public-private partnerships and by new incentives for scientific endeavour.

Just as rural poverty reduction, growth in staples yield and farm income expansion in developing countries have slowed down, before the gains have spread to many areas, exciting new scientific prospects have been opened by transgenics. These have produced intense debate and polarized arguments. Careful consideration of trade laws, environment and safety regulations sympathetic to developing countries are important to ensure that neither the poor, nor the world, are exposed to undue risks. However, from the perspective of ending poverty, a greater risk is that gains from transgenics will not reach the poor and the hungry. Decisions must not be confined to the world of business and politics, but should be open, drawing on the experience of professional research, the rural poor themselves (labourers and

consumers as well as farmers) and organizations in direct contact with them.

Poverty, markets, liberalization and globalization

The poor need technologies to increase output from their assets, and they also need markets to exchange that output freely and to best advantage. Yet the poor are dogged by the market power of others, market failure, bad distributional outcomes from market 'success', and barriers to market access. Rural areas are dispersed: in remote areas, market access problems are most serious, and competition and information least adequate. Action by civil society, government, donors and often the poor themselves can greatly improve their relative access and strength in markets. Globalization can bring significant benefits to the rural poor. But it will bring most benefits if attention and support are directed towards helping small producers to make the best of their market-mediated relations with vastly more powerful and international private-sector operators.

Access to information is an overlooked area for the rural poor; more information would enable farmers to take better decisions on markets and services. Investment in rural roads brings striking returns in both GNP and poverty reduction. It is less affordable in remote or sparsely populated areas, but here, more imaginative solutions can improve physical market access or reduce the cost to the poor. 'Getting the prices wrong' is seldom sensible, but getting them right often does nothing to solve the market access problems of remote areas, and can even make them worse.

Liberalization and globalization are changing the landscape of many poor rural areas. Despite their economic advantages of labour intensity, poor farmers have difficulty meeting exacting supermarket or export standards. Donors can work with NGOs and cooperatives, as well as governments, to provide support and to increase the bargaining power of the poor through trade and marketing associations.

Policies for pro-poor rural institutions

The poor are largely excluded from the institutions and partnerships that can enable them to share and control the decisions that affect their lives. This is because institutions often tend to be controlled by the powerful non-poor. Channeling appropriate assets such as land and education, technology to raise the productivity of assets, and markets to improve sales and purchases, improve the poor's 'exit options' that over time may also help them alter institutions for their sustained benefit. Decentralized institutions for natural resources management and financial services have not always been successful in reaching the poor, although they have been important in helping the poor, through increased efficiency and sustainability, as the local elites are driven to recognize their shared interest with the poor.

Poverty reduction is a complex task, requiring sustained commitment to consistent, yet flexible, joint action. There are no quick fixes and no easy solutions. No single institution, national or multi-lateral, public or private, and no single strategy can hope to deal effectively with the different contexts and causes of poverty. Coherent anti-poverty strategy therefore requires stable partnerships, based on trust as well as self-interest.

It is important to recognize the need for sustaining the management of change towards pro-poor institutions and programmes through support from below. The coalition of the poor among themselves and with others provides the best hope for the poor to get integrated with a process of sharing wealth and development more equitably than before. The best guarantee of good policy is effective accountability.

**RESUMING AND SPREADING THE RETREAT
OF RURAL POVERTY: BUILDING A GLOBAL
PARTNERSHIP AMONG THE STAKEHOLDERS**

Micro- and meso-level partnerships were discussed earlier. Macro-partnerships provide the overarch-

ing global framework for anti-poverty strategies. An important purpose of the macro-level partnership is enhanced aid effectiveness through improved donor coordination.

Since the 1995 United Nations Social Summit, the international community has been reconstructing the global partnership with the poor. The most recent expression was at the Millennium Summit in September 2000, when Heads of Government and State confirmed the commitment to halve the incidence of extreme poverty by 2015. For some time, therefore, the United Nations system has regarded poverty alleviation as its overarching objective. Major donor countries under the auspices of the OECD have agreed to realign aid towards similar poverty targets at national level. The Poverty Reduction Strategy Papers (PRSPs) being prepared by each recipient of World Bank and IMF support underpin this process.¹

Unfortunately, the material basis for achieving this global poverty target in terms of development assistance has not been strengthened, and indeed has eroded over recent years. As we have seen, the bulk of the poor are in rural areas, drawing their livelihood from agriculture and related activities; yet development assistance to agriculture fell by nearly two thirds between 1987 and 1998. Assistance has also tended to shift from supporting productive activities by poor farmers towards social sectors.

Thus, there is a paradox: an ambitious target for poverty alleviation with fewer resources to achieve it. If the target of reducing extreme poverty by half by 2015 is to be achieved, overall development assistance must be raised and the share going to agriculture should reflect its importance in generating livelihoods for the majority of the poor.

Once that condition is met, the challenge is to develop and foster genuine cooperation, good governance and a policy framework in which the rural poor in developing countries can participate.

Box 6.1: Development partnerships

The Comprehensive Development Framework (CDF) is a holistic approach to development. It seeks a better balance in policy-making by highlighting the interdependence of all elements of development – social, structural, human, governance, environmental, economic and financial. It is based on the following principles:

- ownership by the country. The country, not the assistance agencies, determines the goals and the phasing, timing and sequencing of its development programmes;
- partnership with government, civil society, assistance agencies and the private sector in defining development needs and implementing programmes;
- a long-term vision of needs and solutions, built on national consultations, which can engender sustained national support; and
- structural and social concerns treated equally and contemporaneously with macroeconomic and financial concerns.

CDF is still at the experimental stage but, once operational, will offer a global partnership framework for selective IFAD participation at the country-level within the ambit of its central mandate and strategic framework.

The United Nations Development Assistance Framework (UNDAF) is a strategic planning and collaborative framework that helps to identify priorities for UN action. It is a key component of the Secretary-General's reform proposal of July 1997, and is designed to bring greater coherence, collaboration and effectiveness to UN development efforts in the field.

Participation by many UN agencies, including IFAD, in UNDAF provides the operational framework for donor coordination, and a pilot phase has been launched in 19 countries.

Developing country governments and donor agencies need partnerships to ensure a cost-effective attack on poverty; the rural poor need partnerships to support their own initiatives, but free of the intrusiveness for which donors are sometimes criticized.²

Hence donors are emphasizing partnership-building to improve the efficiency and effectiveness of poverty reduction efforts and to build a consensus on:

- setting development priorities;
- reforms necessary to pursue these priorities;
- the programmes and/or projects in support of the reforms; and
- the successful implementation of these programmes and projects with better definition of the responsibilities of the stakeholders in the process.

One response to the scarcity of development resources has been efforts to coordinate available aid funds around shared initiatives against poverty. Both the CDF proposed by the World Bank and the UNDAF provide frameworks for such mutuality (Box 6.1):

Effective coordination among donors is of increasing importance to reduce duplication and avoid placing too great a burden on the host country's administrative and management capacity. Multiple donors and programmes may also cause confusion within the government. Grateful as they may be for assistance, governments might come to see donor activities as more of a hindrance than a help, given the extra burden on government personnel in trying to manage different overlapping activities.

The global initiatives to forge coalitions and partnerships among and with developing countries donors are welcome. However, success requires the substance to be made 'bottom-up' in two ways.

First, each government has to be responsible for country policy. History shows that imposed conditionality in aid, and anti-poverty planning from Northern capitals for the Asian or African poor, seldom works. So each government in the PRSP process has agreed to 'chair' a national poverty partnership, constructing an anti-poverty strategy with civil-society agencies, to be embodied in the

PRSP. In Asia eight countries are working with the Asian Development Bank on strategies directly geared to the Social Summit's 2015 targets on poverty, health, education and gender equality.

Second, the poor themselves have to take responsibility, as agents, for their own development; the poor, not just an abstract 'civil society', which can be biased towards the rich and strong. Even where the poor can overcome that bias, civil-society institutions are underdeveloped in some countries and repressed in others. The key issue is whether the poor have room for manoeuvre by capturing particular local or central institutions, or by coalitions with some of the strong. If poverty reduction is to reach the poorest, often linguistic minorities in remote rural areas, the problem is more difficult.

FUTURES OF SUCCESS, FUTURES OF FAILURE

The future outcomes of rural poverty could be worsened by matters not reviewed in this report, such as increasing war or civil violence, or worse-than-expected effects of AIDS or global warming. Conversely, competent and stable public policy in large countries with substantial mineral resources, such as Nigeria or D. R. Congo, could bring much larger and swifter falls in poverty than are now expected. We close, therefore, by looking 20-25 years ahead, and asking: what policies might then be needed to cope with the consequences of success or failure at dealing with rural poverty? How might policies put in place now make the task easier?

Success in reducing mass poverty in low-income countries initially depends on progress in farm yields and employment, and later on a transition towards employment-intensive non-farm products, alongside a fall in the number of people engaged in agriculture, and increasing urbanization. Improved small-scale agriculture in developing countries is essential for meeting immediate poverty reduction targets, and can contribute

decisively to the overall development process, including the emergence of quite new opportunities for income and employment in other sectors. It is a stepping stone to larger solutions, but it is not itself the whole solution.

Several East Asian countries, following breakthroughs in farming, have made the transition to broad-based non-farm growth. This tends to make urbanization faster, not slower, creating new problems, but problems that are more soluble because migration is spurred by rural success rather than by desperation.

However, widespread labour-intensive rural non-farm growth appears to have been central to East and South-East Asian success. We know that such growth is, in its early stages, fastest when there is demand, especially for consumer goods, from a not-too-unequal, fast-growing local farm sector. Such rural non-farm growth readily broadens to wider markets later. Hence, the strategies of labour-intensive technical progress, and wide distribution of land and human capital, not only reduce poverty in the short run, but also ease the transition from agriculture-based to more broad-based poverty reduction.³

What of the effect, 20-25 years hence, of failure to achieve rural economic growth or to translate it into widespread poverty reduction? Periods of faster growth, overall, are associated with faster poverty reduction, but there are big differences among countries in their success in turning growth into rural and urban poverty reduction. The failure of African rural poverty to fall is surely explained mainly by agricultural stagnation; recent exceptions to stagnation, such as Uganda, Ghana and parts of Ethiopia, appear to show some poverty decline too. On the other hand, India enjoyed faster growth in 1992-99 than in 1975-89, but much slower responsiveness of rural poverty to agricultural or overall growth, and hence slower rural poverty reduction. It is hard to believe, especially with the fertility transition so that poor rural

people have fewer and better-educated children, that the slowdown in rural poverty decline in India will continue if agricultural growth is maintained. It is, unfortunately, plausible however that poverty will persist in much of rural Africa if agricultural growth does not speed up, especially where land distribution is also very unequal.

This report documents great progress in the reduction of rural poverty, but shows a worrying slowdown and a failure to reach large areas. The sources of progress lie in getting assets, appropriate technologies and market access to the poor, and in their obtaining more influence on decentralized and national-level institutions. The poor themselves, NGOs and organizations such as IFAD have been instrumental in securing participation

by the poor in decisions on credit, farm technology, natural resources management and much else that affects their chance to escape poverty.

We are now at a turn in the road. Some of the old effective solutions, like classical land redistribution, the Green Revolution and irrigation expansion, have run into limitations. Yet the reasons these solutions were effective remain valid: the poor still need access to labour-intensive, security-enhancing assets and technologies. The institutions, the required local and global partnerships (linking the poor especially with scientists and with the private sector), and the market forms best suited to obtain such access for the poor, have changed. But the need for the poor to participate in their own emancipation remains the same.

Endnotes

- 1 Initially a country PRSP is a precondition for debt relief under the Highly-Indebted Poorest Countries Debt Initiative (HIPC DI), but will soon become a precondition also for loans from the Bank on aid terms (via the International Development Association, IDA), or medium-term support under the IMF's Poverty Reduction and Growth Facility, formerly the Enhanced Structural Adjustment Facility.
- 2 Sceptics argue that even 'partnership . . . is essentially a [way] for donors to become more intrusive . . . for a more effective, more collective enforcement of the liberalisation agenda' (Abugre 2000).
- 3 Perhaps that is why, even when agriculture has shrunk to 10-20% of GDP, differences among nations in farmland inequality continue to explain much of their variance in overall inequality (Carter 2000).

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