

# Poverty and Land Degradation Linkages in the Developing World

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## Abstract

*The review article examines the debate on the poverty-environment hypothesis postulated by the Brundtland Commission. Different theoretical perspectives agree on the fundamental postulation of this hypothesis. However, they differ in their explanation of poverty, land degradation and development problems. The roles of population growth, market forces, knowledge of farm and environmental management, physical factors and the state are perceived differently by the different perspectives presented.*

**Key words:** Poverty; Environment; Neoliberalism; Neo-Malthusianism; Regional Political Ecology

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## Introduction

*“Many parts of the world are caught in a vicious downwards spiral: poor people are forced to overuse environmental resources to survive from day to day and their impoverishment of the environment further impoverishes them, making their survival ever more difficult and uncertain.”* (WCED 1987: chapter 1, paragraph 3)

There has been a coincidental correlation between the rate of environmental degradation and increasing poverty in the South. Soil erosion, deforestation and water depletion, among other things, is said to be caused by poverty and to put in jeopardy the main livelihood of most rural people. In addition, the dependent nature of rural people on environmental resources makes them vulnerable even to minor climate changes. The bleak picture painted by environmental pessimists, who depict the unfolding of an environmental nightmare, forms the basis of the poverty-environment hypothesis. Environmental deterioration is seen as the result of the acts of millions of poor farmers struggling for survival, eroding land by cutting down trees for warmth and fuel and by overuse, thus leaving the landscape denuded. Countering these views are those researchers sympathetic to the situation of peasants and their environment. They shift the blame from poor peasants to climate change and to national and international economic policies. Furthermore, there has been a shift from the polemic of single factor explanations that blame either nature or humans to more integrated frameworks recognising the existence of patterned relationships between climatic events, rural population densities and types of environmental degradation.

In the minority view in development thinking a people-centred bottom-up paradigm is still standing strong. It stresses participation and decentralisation in contrast to top-down planning which still dominates development practice. However, international organisations and national governments fortunately realise to some degree that rural people are indispensable in the formulation of environmental policies because of their knowledge of the environment and because their co-operation must be solicited for any policy to succeed. The poverty-environment hypothesis says that poverty leads to population growth due to the desire of poor people to invest in more children as a source of economic and social security. A Malthusian spectre follows the increase in population whereby

land fragmentation, depletion of soil fertility, wood cutting and other biophysical resource deterioration results in migration and colonisation of physically marginal land. This in turn leads to a fall in food production, declining standards of living and hence poverty. Lack of access to alternative employment in urban areas results in rural people overexploiting their environment in order to survive.

The multitude of hypotheses regarding the causes of land degradation and its relationship to poverty can be grouped into four: the classical, the political economist, the neoliberal, and the regional political ecology views. These views will be studied in relation to the poverty-environment hypothesis.

### **The classical view**

The classical view is espoused by physical ecologists using neo-Malthusian analytical frameworks. They regard natural factors such as drought, excessive rainfall or floods, high temperatures and certain soil mechanisms as operating side by side with human factors that are caused by increasing population and poor management of land resources. As Kangwar (1982, quoted in Chambers 1983) explains:

***“Mankind today is faced with many challenges, the biggest being from the population explosion and poor resource management.”***

He stresses good soil management as crucial to the survival of mankind. The population variable is seen as having a direct causal impact in activating the downward spirals of poverty and environmental degradation. It is assumed that economically, the poor are forced to forgo long term investment in the natural resource base in favour of a short-term preference. The classical view sees mounting demographic pressure on natural resources as the paramount factor that causes environmental decline and poverty (Ehrlich 1971, Eckholm 1976, Brown 1989, Ehrlich and Ehrlich 1990, Hofstad 1997). The carrying capacity of the earth is seen as finite and resource destruction results when too many people intensify their efforts to extract food and other needs. Hence as population increases, natural resources decrease, and this leads to migration and human resettlement changes. This in turn results in destruction of

biodiversity. The solution to environmental degradation is therefore simply control of population growth.

Poverty is attributed to the characteristics or condition of poor people. Parasites, diseases, malnutrition, insanitary conditions and poor housing are regarded as proximate causes. The physical weakness interacts with other disadvantages to perpetuate poverty. Uncontrolled population growth and uncontrolled exploitation of resources, in this view, combine in a vicious circle: the more people there are, the more they destroy the long term potential of fragile environments making the poor even poorer.

The issue of appropriateness of resource management practices constitutes a strong causal explanatory factor under this view. Poor people are accused of employing inefficient resource management systems and farming practices that are deleterious to the environment. This is due to their lack of skills, illiteracy and fatalistic attitudes, and the use of out-moded tools. Poor management of the environment by these "unskilled" farmers leads to the destruction of the environment, which in turn reduces the output they can extract from it. This results in a falling standard of living and a self-generating poverty trap.

### **The neoliberal view**

The neoliberal view is based on the assumption that the best way of allocating natural resources is through the market. Neoliberals advocate a shift of the role of the state from its traditional proactive role of promoting productive activities to one of providing only the necessary conditions for private business. The market is seen as a perfect instrument that allocates all resources in the most judicious manner. The neoliberal view argues that competition necessarily leads to the appropriate management of resources. The removal of market distortions is a necessary and sufficient condition for environmental redemption (Aubynn 1997). Individuals, organisations and firms are supposed to act rationally in their resource usage in order to remain in competition and in existence. These well-functioning markets are said to be absent or distorted in developing countries where governments are interfering with them and where common property land tenure systems exist. Communal tenure is treated as an obstacle to technical progress. Agricultural intensification, it is argued, cannot take place outside private property. Environmental degradation in the tropics is attributed to faulty incentive systems affecting economic and demographic

behaviour centred on the use of common property resources (Hardin 1968) and to "irrational traditional" land use decisions of small producers.

A reduction of the role of governments in influencing the market, the liberalisation of trade and privatisation schemes have been suggested as remedies to underdevelopment and hence environmental deterioration. The introduction of Structural Adjustment Programmes (SAP) all over the South and Eastern Europe has been seen as necessary in removing *dirigisme* and infusing efficiency by allowing markets "to set prices right". Economic growth resulting from SAP was also supposed to benefit the economies socially and environmentally. The above objective was born out of the assumption of the operation of the environmental Kuznets hypothesis. This hypothesis examines the relationship between environmental degradation and income per capita, which takes a U-shape. It is argued that at the initial stages of economic development, growth in income is accompanied by inevitable negative environmental consequences due to intensive quantitative expansion of resource extraction (Auhynn 1997). The situation is thought to change after a while when environmental awareness, technology developments, and structural changes emerge, with sustained economic growth resulting in a levelling-off and a gradual decline in environmental degradation (Dasgupta and Maler 1996).

### **The political economy view**

Political economists see rural poverty as a consequence of processes that concentrate wealth and power. They agree that poverty is to be understood primarily in terms of economic forces, social relations, property rights and power (Kurien 1978, in Chambers 1983). This conceptualisation of poverty reveals the view that poverty is essentially a social phenomenon and only secondarily a material or physical one.

The neo-Marxist dependency perspective is resorted to when explaining the process of wealth concentration. Internationally, the richer countries control trade and make poor countries poorer by exploiting them. They use mechanisms such as unequal exchange, monopoly over a range of resources (institutional and material) and repatriation of profits from capital investments. Within countries or internally, the ruling classes and other categories of the bourgeoisie exploit the lower classes through shifts

in rural-urban terms of trade and investment in urban industries and services. And within rural areas themselves, the local elite - land owners, merchants, moneylenders and bureaucrats - consolidate their power and wealth. A scenario is created whereby the local elite drain resources from rural environments, which in turn are shared by the urban bourgeoisie. Higher up the ladder, monopoly capitalism directs resources from poor countries through unequal exchange and capital investment to rich countries. Two important processes aid in the above scenario: technology and commercialisation. Capital intensive technology subsidised through foreign aid, overvalued exchange rates and direct government support is accessible to only those who already command credit and land (Frank 1969, Chambers 1983, Amin 1997).

Commercialisation, on the other hand, introduces products that out-compete rural products, thereby stilling local industry. Both concentrate wealth and create inequality, which in turn destroys the social system of egalitarian communal life. Hesselberg ascribes the worsening of living standards for a part of Botswana's population in the 1980s to destruction of the social system of subsistence for the purpose of integrating the country into the global market economy (Hesselberg 1985).

The rural poor lose in these processes, as low international prices for products of their countries reflect the low prices internally for rural produce. Low prices of agricultural products coupled with rising prices of agricultural inputs create poverty and concentrate wealth in the hands of the powerful. The local elite and some urban bourgeoisie buy or appropriate the best lands or common resources, make labourers out of the original peasant population and suppress wages. This makes the poor poorer and rural families become impoverished and isolated without the capacity to improve the lands they use.

External factors are seen as the most crucial in this perspective, as they alter production systems that in turn induce environmental decline (Murdoch 1980, Smith and O'Keefe 1980: quoted in Eckholm and Brown 1977). These factors, which take the form of inappropriate and exploitative technology and poor prices of traded items, account for the environmental decline being experienced in these regions. Governments in the South are forced to emphasize export production for the global market and encourage international corporations into their countries. A consequence is the use of Western technology that is often not made for tropical

environments. These inappropriate management practices and technologies are said to result in environmental destruction. Alternatively viewed, the excessive demands in the Developed World for environmentally destructive commodities are blamed for the deterioration of the environment (Nations and Komer 1983; quoted in Boyo 1997, Myers 1989).

### **The regional political ecology view**

The regional political ecology concept emerged in response to the objective of providing an integrated analysis of the man-environment relationships through the integration of both physical/human ecology and political economy. Regional political ecology recognises multiple causation, multiple objectives and multiple interventions. Blaikie (1985) and Blaikie and Brookfield (1987) formulated the Regional Political Ecology Framework. This framework is influenced by Marxist concepts of dependency and marginalisation as well as by human ecology perspectives. The framework examines the interacting roles that social institutions at various geographical levels play in creating constraints and possibilities affecting human decisions that in turn affect those institutions as well as the natural environment (Stonich 1993). Stonich (1993) summarises the essential elements of the approach as follows:

- Political ecology combines the concerns of ecology and political economy, thus integrating human and physical approaches to environmental destruction.
- Analysis follows a "chain of explanation" through different levels of examination analysis, beginning with the decisions of local land managers (such as farmers), the interrelation among local managers and other groups in society which affect local land management, as well as the roles of the state and the world economy.
- Because political economy insinuates the analysis of structures which are external to local groups and which affect options and decisions, considerable attention is focused on the ways in which international capitalism and the state affect natural resources and local people.

The approach also emphasises both place-based and non-place-based analysis. There is a need to study the physical manifestation of the problem of land degradation in a place-based analysis. Such a study is location specific and conjunctural because it 1) reveals physical symptoms and physiographic variables; 2) directs concern to other places where there is no degradation, but where processes of displacement of land users is causing degradation at another site; 3) shows other places that feel the effect of soil erosion downstream in the form of deposition and floods (Blaikie 1985).

Non-place-based analysis involves networks of economic and political relations acting directly and indirectly upon land users and the environment. Social factors are expressed in land-use patterns, the spatial patterns of agricultural technology and other more complex "eco-class" relationships (spatial marginalisation and marginalisation in weaker groups). They are also the political-economic structures within which land-use decisions are made (Blaikie 1985).

The theoretical approach in sum seeks to investigate why the decisions of land managers sometimes cause environmental deterioration, subverting their own livelihoods. Regional political ecology, like the political economy analysis, does recognise the fact that poor people engage in practices that degrade the environment, but stops short of putting the blame on them. Blaikie and Brookfield (1987) explain that both the processes of development and underdevelopment can lead to soil erosion. Land degradation can undermine and frustrate economic development, just as low levels of economic development can have a strong causal impact on the incidence of land degradation. Blaikie (1985) describes the reciprocal link as the desperate ecocide of the poor: small producers who cause soil erosion because they are poor and desperate and whose problematic condition soil erosion in turn exacerbates.

***"They [the poor] may be forced to destroy their own environment in attempts to delay their own destruction."* (quoted in Durning 1989: p 23)**

The eco-demographic concept of the regional political ecology framework outlines how core-periphery relations and capitalism lead to land tenure changes that cause the marginalisation of peasants through displacement

into fragile ecosystems. O'Brien (1995), in her studies of deforestation and climate change in Selva Lacandona, Mexico, states that "common causal explanation of deforestation such as timber extraction, peasant colonisation and agricultural and livestock expansion, although overt causes, do little to truly explain the process of deforestation. Rather, one must consider economic, social and political relations that have made the Selva Lacandona a focus of land speculations, a source for rapid capital accumulation, a refuge for displaced and disempowered people, a political safety valve for concessionary agrarian policies, a base for a revolutionary movement and a spotlight for national and international conservation struggles" (O'Brien 1995: p 43).

These entitlements are governed by political and economic powers at the local level and define the rules of legitimacy of each household (Vessa-Matti 1993). Shifts in entitlement often cause the degradation of land and human resources (Krokkfors 1991). In Krokkfors' model, bad income opportunities, low societal capabilities and low physical capabilities of the land all contribute to a decreasing land capability (degradation), which in turn is closely related to increased poverty. Simply put, the lower the ability of people to increase their standards of living through cultivation and other income sources, the lower the capability of the institutions in society to provide the necessary conditions for production, and the lower the resilience and quantity of the resource base, the higher the risk of resource degradation.

The main notion expressed here is that small producers are displaced to less fertile or environmentally more vulnerable locations because of land expropriations by the state or by large agricultural business companies. Small producers are placed in a position where they may be forced to over-exploit a scarce resource in order to survive (Blaikie 1985, Grainger 1992). Stonich (1993) asserts that inequality in access to land and the investment patterns of large landowners, neither of which depends on population pressure, are at the core of widespread environmental destruction in the Honduras. The Tribal Grazing Land Policy (TGLP) in Botswana, which favours large cattle owners, has been characterised as a land grab, the taking away of large grazing areas traditionally used by small farmers (Hesselberg 1993).

Varying entitlements to land and other resources depend on different access qualification (Sen 1989)

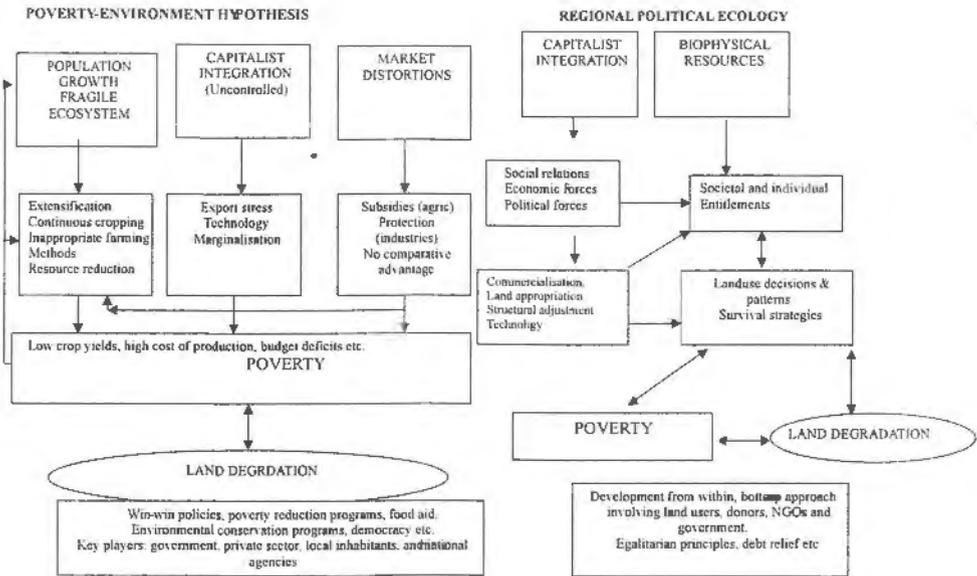


Figure 1. Views on the Poverty-Environment Debate

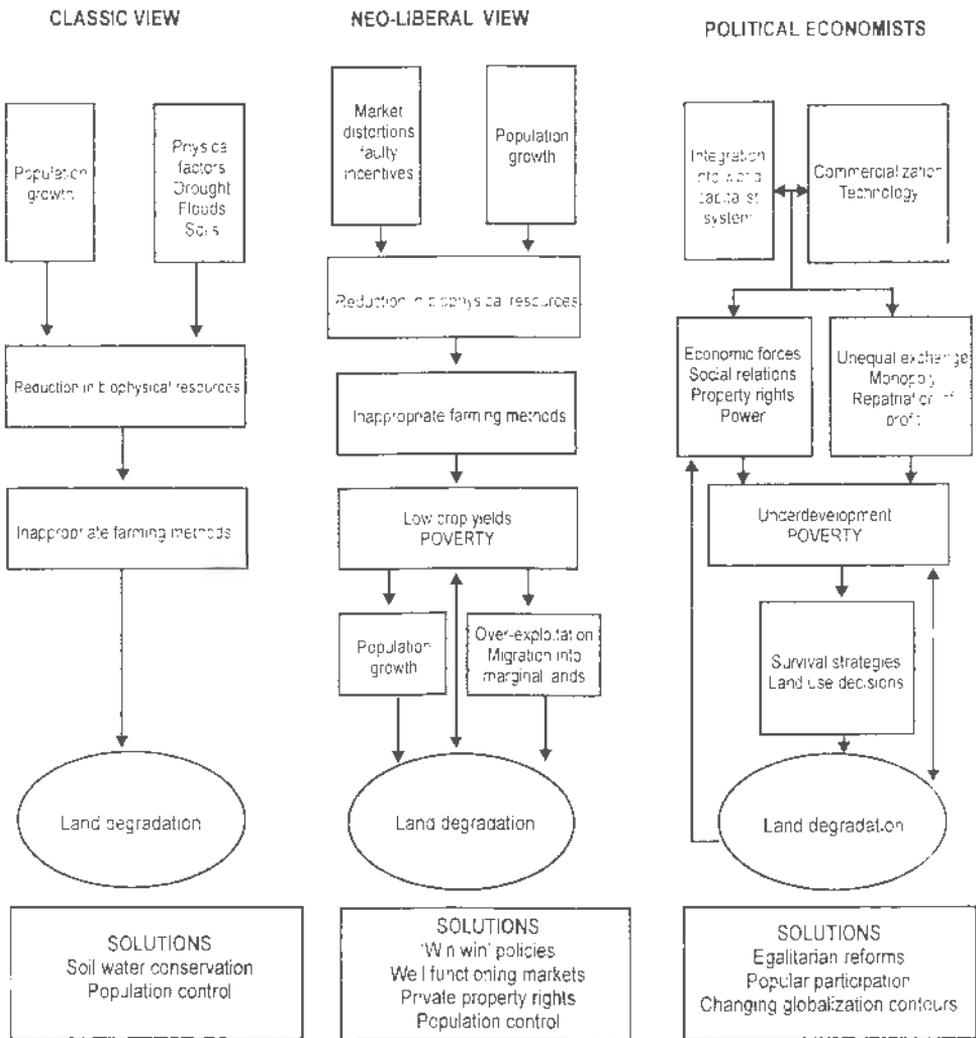


Figure 1: Cont. Views on the Poverty-Environment Debate

## Synthesis and discussion

The various development perspectives discussed above present a major opinion on the poverty-environment hypothesis: poverty is forcing poor people to degrade their environment, which in turn makes them poorer. The views vary a great deal in explaining that outcome in terms of the solutions proposed and the weights assigned to variables such as population growth, government policies, free markets, institutions and technology. Over the past decade views on development problems from different camps have begun to converge, showing the importance of integrative and multidisciplinary studies, which the World Bank, the IMF and the United Nations have been sponsoring and promoting.

From the views outlined above one can identify two main lines of thought:

- 1) The extent of and solutions to the problems of land degradation are well known. The problem is to get people to implement these solutions (the classic and neoliberal views).
- 2) The nature and extent of land degradation are imperfectly understood. Local people often reject (western) conservation technologies for good reasons, and in fact, often adopt their own individual and collective approaches to sustainable livelihood practices (the political economy and regional political ecology views)

The Brundtland Commission's report on the poverty environment hypothesis sought to integrate explanations from the political economists and the neoliberals. It is therefore difficult to identify a clear-cut focus of the hypothesis both on problem identification and on institutional prescription. One realises that among the hosts of prescriptions advocated by the UN, those actually being executed belong to the neoliberal ideas of the World Bank and the IMF. This trend can be explained in the light of financial capability. These international finance institutions only provide funds to support policies they consider germane to their cherished path of development of liberalised markets. Poverty alleviation and environmental projects have, contrary to original intentions, enriched project officers, increased income inequalities and further distorted markets. Poverty alleviation programs have also become political tools for winning elections and for achieving other political goals in poor countries (Stokke

1995). Have we seen a decline in land degradation in response to reduced poverty? Against popular expectation the trend of land degradation continues unabated.

However, it should be noted that the views under each perspective have been modified over the years. The point of departure of the various perspectives is assessed by looking at the most important variables that have been used in explaining poverty, land degradation and development problems in the South.

### **Population growth**

**The classic** and **the neoliberal** views start on the premise that rapid population growth is inimical to economic development, and that physical conditions of a place interact with increasing population to cause environmental decline. A large and increasing population that is predominantly agrarian and is sustained by a fragile ecosystem, as pertains in sub-Saharan Africa, easily over-mines the resources available. The pressure of population can raise agricultural demand, leading in turn to the abuse of marginal land and other natural resources (World Bank 1991). Population growth is both cause and effect of environmental problems. Population growth is said to cause land degradation, which results in poverty. Poverty in turn prevents people from sustainable management of natural resources.

**The political economists** and **regional political ecologists** see other factors as having overriding influence on population growth. Population growth is not seen as having played a major role in the generation of poverty and resource degradation. Population growth is rather hypothesized as eventually having good environmental consequences as it brings about technological development and improvement in managerial skills. There has however been a change in this view as some authors under this umbrella now recognise the potential danger that population growth poses to the environment and development. However, they still maintain that if other factors were to function well, the population variable would not be a major problem (Blaikie 1989, O'Brien 1995).

### ***The role of market forces and the state***

The classic view ascribes an important role to the state. Land and water conservation programmes were the main priorities of states at the beginning of the century through to the 1970s. Capitalist planning constituted the main development strategy as opposed to free market policies.

**The neoliberal view** mainly advocates free markets and a reduction in the role of governments in productive activities. Environmental degradation is attributed to faulty incentive systems affecting economic and demographic behaviour based on the use of common property resources. Inappropriate and excessive government interventions in markets and incompetent, inefficient and corrupt state bureaucracies all contribute to the state of poverty and environmental degradation.

**Political economists and regional political ecologists** blame both the role of governments and free markets for the environmental and development problems in the South. The incorporation of pre-capitalist societies into the world market created constraints upon local people, which made them to take decisions that degraded their environment. Growing inequality and socio-economic differentiation within peasant communities and in their relationships with traders and state agencies results in the impoverishment of small farmers, and this in turn forces the poor to over-exploit their environment (Blaikie and Brookfield 1987). The socio-politico-economic repercussions of the expansion of capitalism have been commercialisation, appropriation of lands for conservation and private enterprises, introduction of inappropriate technology, misuse of technology and the "evils" of structural adjustment. These processes shape the land use decisions and survival strategies of the people. Even though the state is seen as not doing enough to bring about development or actually being blamed for mismanagement of the economies, the ultimate answer to these problems is seen as coming from the state. Recent post-modernists think the answer will come from social movements that will modify governments' role to make it a more pro-people centred one.

## Local resource management

**The classic and neoliberal views** blame resource degradation on the management practices and communal tenure system prevalent in rural societies. The communal tenure system is said to cause resource degradation, as every member of a community looks at the net benefit of employing more resources rather than considering the ultimate danger it poses to the whole community (Hardin 1968). Unchanging methods such as shifting cultivation, bush fallowing and grazing techniques in the face of growing populations result in resource degradation.

**Neoliberals** now agree that resource management practices of the poor are sustainable, but add that the pressure of population on resources makes such practices untenable. Hence the need to adopt modern technology from advanced nations and to change from communal tenure systems to private ownership. The World Bank's World Development Report 1992 accepts that people and institutions are rational and reasonable in their behaviour when people's objectives and knowledge and the structures within which they make their decisions are taken into account.

**Political economists and regional political ecologists** defend the farming systems and resource tenure systems that have been blamed by the classic and neoliberal views. The agricultural systems practised have been proven to be more sustainable than imported systems. Local people often reject conservation technologies for good reasons, and adopt their own individual and collective approaches that in the past have resulted in sustainable livelihood practices (Chambers 1983). Degradation has been found to be prevalent on both common and private property. This negates the assumption of rational resource utilisation under private property. In addition, Africa's communal land tenure systems provide a social security net for all members of families who own land. Evidence shows that traditional tenure systems are not fixed but change in response to changes in socio-economic conditions (Amanor 1999, 2005).

## The role of poverty

**The classic view** implicitly argues that poverty leads to land degradation. Population growth and poor resource management result in land degradation, which erodes the livelihood of the people, making them

destroy environmental resources. **The neoliberal view** argues openly that environmental challenges stem directly from poverty. Increasing impoverishment and lack of other alternatives force a swelling number of poor and landless people to put unprecedented pressures on the natural resource base in their struggle to survive. Past resource degradation is said to deepen today's poverty, while today's poverty makes it very hard to cater for or restore the agricultural resource base, to find alternatives to deforestation, to prevent desertification, to control erosion or to replenish soil nutrients. Extreme poverty forces people to migrate to marginal lands.

**Political economists** concentrate mostly on the trickle-down effects of larger processes on rural people's actions. The political economists see rural poverty as a consequence of processes which concentrate wealth and power. New economic forces, social relations, property rights and power patterns emerge which are characterised by production for export, exploitation at all levels, profit-making motives, misuse of technology and environmental destruction. The above characteristics, in addition to unequal exchange, monopoly by advanced nations over a range of resources and repatriation of profits by foreign firms, eventually impoverish these nations and throw them into an underdevelopment trap. The exploitation of rural people makes them poor and forces them to adopt survival strategies that destroy the environment. They are thus executioners of the final task dictated by external and internal factors.

**Regional political ecologists** explicitly acknowledge the consequences of the activities of poor people on the environment. Blaikie (1985) blames the land use patterns of poor peasants for the soil erosion in rural Nepal. Sen (1981) relates the degradation process to a loss of the ability to access resources in an environmentally friendly way. Low incomes and access problems dictated by economic and social processes, which are results of capitalism's expansion, lead to land degradation. The poor are said to destroy their main livelihood in order to delay their own destruction. The poor do not wilfully degrade the environment, but lack the resources to avoid degrading their environment. Lack of assets and productive resources, and vulnerability to both slow and gradual and sudden and catastrophic entitlement declines, are said to result in poor resource management.

## Solutions to poverty and land degradation

**The classic view** proposes a control of population through educational campaigns and availability of contraceptives, technology transfer, stringent and extensive land and water conservation programs, as potent solutions to poverty and land degradation.

**Neoliberals** argue that the way out of the vicious circle of poverty lies in reducing poverty through agricultural growth, promoted by a reliance on farmers' responses to marked incentives (World Bank 1990; quoted in Biot et al. 1992). They propose an economic approach to the environment, including the evolution of property rights and contractual arrangement, as well as appropriate and bureaucratic regulation, market support, a curtailment of the role of governments in influencing the market, the liberalisation of trade and privatisation schemes. However, they do not provide enough insight into how the state can perform necessary functions when the idea is that it should minimize its overall role.

To the **political economists** solving the underdevelopment conundrum has to do with ensuring fair international trade, stopping exploitation by all categories, removing inequalities from society, and changing the globalisation contours that are encouraging monopoly. The state is seen as an enemy in the development process and at the same time as the institution that should carry out the egalitarian reforms being suggested. Development is seen in the same light as the classic view where societies move from a lower level / primitive stage to a higher / technological stage.

**Regional political ecologists** advocate that different solutions be resorted to in different socio-political situations. Broadly, they advocate that development should be from within and must follow a bottom-up approach involving land users, governments, non-governmental organisations and donors. Imposition of development strategies from donor agencies is criticised, but technology development and other lessons from developed countries are seen as offering leapfrog jump possibilities. Reforms in institutions that create room for social and economic incentives that reduce poverty and promote environmental sustainability are advocated.

## **Conclusion**

This review has shown that although the various perspectives presented have a common view on poverty's negative impact on the environment at a general level, there are important differences when it comes to the explanation for both poverty and land degradation. The emphasis the Brundtland report placed on poverty in the overall explanation of environmental deterioration is not tenable. Today there is an agreement that poverty impacts negatively on the environment in certain places, at certain times and regarding certain issues. Poverty was not and is not the main explanation for global or national environmental problems. Most, if not all, regional and local ecological degradation also has external causes. The perspectives discussed in this review clearly show a disagreement on the main explanations and on the emphasis on either internal or external forces. This is very well brought out in the presentation of the ideas regarding how to solve environmental problems.

## References

- Amanor, K.S. (1999). *Global Restructuring and Land Rights in Ghana: Forest food chains, timber and rural livelihoods*. Scandinavian Institute of African Studies. Uppsala.
- Amanor, K.S. (2005). *Global and local land markets: the role of the customary*. Quan, J., Tan, S.F., & C. Toulmin (eds). *Land in Africa: Market asset or secure livelihood? Proceedings and Summary of Conclusions from the Land in Africa Conference held in London, November 8-9, 2004*. IIFED. NRI. Royal African Society. London. 103-114.
- Amin, S. (1997). *Capitalism in the age of globalisation*. Zed, London.
- Aubynn, A.K. (1997). *Maladjustment of development. Macro-development adjustment and Ghana's environment. A case of the mining frontier of the western region*. M-Phil. thesis in Development Geography, University of Oslo.
- Biot, Y. et al. (1992). *What is the problem? An essay on land degradation, science and development in Sub-Saharan Africa. Discussion Paper, No. 22*. School of Development Studies, University of East Anglia. Norwich.
- Blaikie, P. (1989). Environment and access to resources in Africa. Coping with land degradation. *Africa Vol. 59, No. 1*.
- Blaikie, P. (1985). *The political economy of soil erosion in developing countries*. Longman, Harlow.
- Blaikie, P. & H. Brookfield. (1987). Land degradation and society. Methuen, London.**

- Boyo, J. (1997). *Structural Adjustment and the Environment: A review of Studies with Emphasis on Sub-Saharan Africa. Forum for Development Studies, No. 1.*
- Brown, L. (1989). *State of the world 1989. A World Watch Institute report on the progress towards a sustainable society.* Norton, New York.
- Chambers, R. (1983). *Rural Development. Putting the last first.* Longman, Harlow.
- Dasgupta, P. & K-G. Mäler. (1996). Environmental resources and economic development. *Lundahl, M. & J. Ndulu (eds). New Directions in Development Economics.* Routledge, London.
- Durning, B.A. (1989). Poverty and the environment. Reversing the downward spiral. *World Watch Paper, No. 92.* Washington D.C.
- Eckholm, E. & R.L. Brown (1977). *Spreading deserts: The hand of man.* World Watch Institute, Washington D.C.
- Eckholm, E. (1976). The two faces of malnutrition. *World Watch Paper, No. 9.* Washington D.C.
- Eckholm, E. et al. (1984). *Fuelwood: The energy crisis that won't go away.* Earthscan, London.
- Ehrlich, P.R. & A.N. Ehrlich (1990). *The population explosion.* Simon and Schuster, New York.
- Ehrlich, P.R. (1971). *The population bomb.* Balantine, New York.
- Environmental Protection Agency (1998). *Upper East Regional Profile.* Accra.

- Frank, A.G. (1969). *Capitalism and underdevelopment in Latin America. Historical studies of Chile and Brazil*. Monthly Review Press, New York.
- Hardin, G.J. (1968). The tragedy of the commons. *Science*, 162.
- Hesselberg, J. (1985). *The Third World in Transition. The Case of the Peasantry in Botswana*. Scandinavian Institute of African Studies, Uppsala.
- Hesselberg, J. (1993). Food Security in Botswana. *Norwegian Journal of Geography*, Vol. 47, No. 4.
- Hofstad, O. (1997). Degradation Processes in Tanzanian Woodlands. *Forum for Development Studies*, No. 1.
- Krokkfors, C. (1991). The political ecology of survival in Africa. A conceptual framework. Michels, G., Floor, K. & A. Toro (eds). *The Third World, The Fourth World: Dimensions of Development Geography*. Department of Geography, University of Helsinki.
- Myers, N. (1989). Population growth, environmental decline and security issues in Sub-Saharan Africa. Hjørt, A. & M.A. Salih (eds). *Ecology and politics; Environmental stress and security in Africa*. Scandinavian Institute of African Studies, Uppsala.
- O'Brien, K.L. (1995). Deforestation and Climate Change in Selva Lacandona of Chiapas, Mexico: Some preliminary results. *Norwegian Journal of Geography*, Vol. 49, No. 3.
- Sen, A. (1989). Food and freedom. Corbridge, S. (1995) (ed.). *Development Studies. A reader*. Edward Arnold, London.
- Sen, A. (1981). *Poverty and famine. An essay on entitlement and deprivation*. Clarendon, Oxford.

Stokke, K. (1995). Poverty as Politics: The Janasaviya Poverty Alleviation Programme in Sri Lanka. *Norwegian Journal of Geography*, Vol. 49, No. 3. 123-135.

Stonich, S. (1993). *I am destroying the land: The political ecology of poverty and environmental destruction in Honduras*. Westview. Boulder.

Vessa-Matti, L. (1993). The village that vanished: The roots of erosion in a Tanzanian village. *Asenso-Okyere, W.K. et al. (eds). Sustainable Food Security in West Africa*. Kluwer, London.

WCED. (1987). *Our Common Future. Report of the Commission on Environment and Development*. The Brundtland Commission. United Nations, New York.

**World Bank. (1991). Assistance strategies to reduce poverty: A World Bank Policy Paper. Washington D.C.**