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The Development Trap: Militarism, Environmental Degradation and Poverty in the South

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Developing countries have made great efforts to speed the process of socio-economic progress in the post-colonial era, often with very ambitious development programmes. However, after many decades of national rule and planning many countries have failed to achieve their development objectives.

To explain this failure we need to be clear about the concept of development. A precise definition for socio-economic development is difficult, although countries can be easily classified into developed and developing categories.[1] Development is a multi-dimensional and dynamic process. It requires high levels of per capita income as well as an egalitarian distribution of income, elimination of poverty and the provision of human basic needs, but without jeopardizing the needs and prospects of future generations. The need is to achieve *sustainable* development: development that ensures rapid economic growth, equal distribution of income, without degrading the environment or jeopardizing the right of future generations to achieve progress and prosperity. Economic growth is thus a necessary but not sufficient condition in itself for development, which also involves social transformation and meeting non-material requirements such as the ability of individuals to participate in economic and political decision making.[2]

Various indicators show the failure of developing countries to achieve development. For example, the rate of growth of real GDP per capita in developing countries fell from 3.9 per cent in 1965–1973 to 2.5 per cent in 1973–1980 and 1.6 per cent in the 1980–1989 period. In sub-Saharan Africa and Latin America during that period, the growth rate of real GDP per capita went backwards, falling to –1.2 per cent and –0.04 per cent respectively. Child mortality in South Asia exceeds 170 per thousand; life expectancy in sub-Saharan Africa is 50 years; and more than 110 million children in developing countries lack access to primary education.

Development economists point to various obstacles to Third World development. These include:

- political instability;
- lack of basic infrastructure;
- inadequacy of well-developed human resources and managerial skills
- unfair terms of trade with the developed world;
- scarcity of natural resources;
- faulty development policies and planning; and
- military intervention and civil wars.[3]

This chapter pinpoints three pivotal factors which inhibit socio-economic development: militarization, environmental degradation, and poverty. Not only do these factors make a large contribution to underdevelopment, but each is also both a consequence and cause of the others. The links between them produce a *development trap* for most developing countries. This chapter explores the interlinkages and feedbacks of these three factors and their direct and indirect effects on socio-economic development, with special emphasis on the African continent. Finally, it looks at possible ways out of the trap, in particular at prospects for military conversion.

POVERTY TRENDS

Poverty refers to the inability to attain a minimum standard of living. This minimum standard of living (the poverty line) requires, according to World Bank estimates, an annual income of $370. On this basis, more than one billion people in developing countries – one-fifth of the world's

population – are living in poverty.[4] The largest number of poor people in 1985 were in South Asia, with over 500 million (about half the population), followed by a further 280 million in East Asia, 210 million in China and 180 million in sub-Saharan Africa. Each year the population increases in size, but the amount of natural resources with which to sustain them, and to eliminate poverty, remains finite.

The high poverty levels of the last two decades are likely to increase in the 1990s for many reasons. First, the Third World's prospects of economic recovery in the 1990s are gloomy due to such problems as debt, world recession and political instability. Second, the population growth rates of most developing countries exceed the rates of GDP growth, and so per capita income will fall in absolute terms. Finally, within countries, poverty has also been exacerbated by the unequal distribution of land and other assets.

MILITARIZATION TRENDS

Militarization is the process of expansion of the military establishment within a society. It can be quantified by a set of economic, political and strategic indicators such as the level of military expenditure and its shares in government expenditure and total GDP, as well as by arms imports, size of the armed forces, and military intervention in the political scene.

Throughout the past five decades, the world has consistently devoted between 4.5 and 7 per cent of global GNP and more than 15 per cent of governmental expenditures to military expenditure. According to a 1983 American study, well over 70 million people were then engaged, directly or indirectly, in military activities. In 1988, world military expenditures exceeded one trillion dollars, world armed forces numbered 28 million and total world arms transfers reached $49 billion.[5] From 1965 to 1985, Third World military expenditure was about 15 per cent of the world total but it accounted for more than 15 per cent of total government expenditure in the developing countries. Although the bulk of world military spending was by the developed countries, the fastest growth was among the poorer countries. This trend declined in the late 1980s but was reversed in 1990.[6]

Military intervention in Third World politics has become a universal phenomenon. Inefficiency of civilian administration, the eradication of corruption, and the characteristics of the armed forces as disciplined

and modern organizations were the declared reasons behind military interventions. Nevertheless, military governments themselves have failed to achieve political stability, and the frequency of military coups has increased in developing countries, and particularly in Africa. The size of developing countries' military establishments has increased enormously in the post-independence period and the last three decades have witnessed high incidence of bloody internal conflicts and civil wars in individual developing countries. Overall, most developing countries have seen considerable militarization since the Second World War.[7]

ENVIRONMENTAL DEGRADATION TRENDS

The speed of environmental degradation, particularly the environmental problems caused by human activities, is receiving mounting international attention. Climate warming, ozone depletion, loss of biodiversity and acid rain are global concerns.

There are many regional environmental threats too, both in developed and developing countries. These include air and water pollution, lowered capacity of groundwater storage, urban pollution, deforestation, soil erosion and desertification. Although the magnitude of environmental stress in various parts of the world is uneven and uncertain, most of this degradation is irreversible.

MAKING THE LINKS

Poverty, environmental degradation and militarization are inextricably linked. If we start with poverty, for example, we find poor people are usually forced to put pressure on their local environment for survival; environmental degradation and competition over natural resources results, which in turn gives rise to social tension and armed conflicts; higher militarization (and consequently high military spending) follows armed conflicts. Higher military expenditure has substantial economic costs, particularly on economic growth, which is needed to combat poverty. This in turn leads to more widespread poverty and the development trap is re-enforced.

If we start with militarization, however, we find that armed conflicts and military establishments are highly polluting.[8] This leads to environmental degradation that jeopardizes economic growth due to

the depletion of resources. However, economic deprivation and poverty are most often the main causes of social tension and armed conflict and the trap is again re-enforced.

Poverty and environmental degradation

Poverty contributes greatly to environmental stress, which itself leads to increasing the levels of penury (the so-called *poverty trap*). Poor people tend to rely on natural resources for their survival and are often forced to overuse environmental resources to survive. This impoverishing of the environment in turn threatens their survival further. In many poorer countries, agriculture, forestry and energy production generate half of the GNP and the export of natural resources contributes substantially to export earnings. Thus their prevailing economic activities contribute directly to resource depletion and environmental degradation in most developing countries. Deforestation, for example, is causing increasingly destructive floods in Asia, and desertification in large parts of Africa and Latin America. In the African Sahel, deforestation followed by soil erosion has turned vast areas of land into deserts. Furthermore, in poor communities the increasing demand for firewood leads to deforestation, or to the use of dry cow dung for fuel which deprives the soil of nutrients. Thus soil fertility declines and the poverty circle closes tighter.[9]

The World Commission on Environment and Development (WCED) in their report *Our Common Future* argued in 1987 that 'those who are poor and hungry will often destroy their immediate environment to survive; they will cut down forests; their livestock will overgraze grass land; they will overuse marginal lands; and in growing numbers they will crowd into congested cities'. Rural-urban migration puts more pressure on the environment in cities as well as the countryside.[10] Some degraded systems may recover, but the loss of just one inch of top soil may take nature centuries to replace. Poor societies are unable to overcome the negative effects they produce, unlike rich communities which have access to funds and technical know-how to absorb the wastes they produce.

Rapid population growth also puts more pressure on the environment and reduces the environment's ability to dilute the wastes produced. Instead, the residuals from production and consumption simply accumulate. Market failures in developing countries are a further cause of environmental degradation. On many occasions, environmental resources are treated as 'free goods'. Some economists also argue that

the falling real incomes of poor farmers leads them to overuse natural resources.

Nonetheless, although poverty contributes to environmental degradation, so too do industrialization and the industrialized nations, particularly in relation to the global environment threats.

The environmental limits to growth

It is now well recognized that the environment affects economic growth and development. During the 1960s and early 1970s, many people argued that zero growth of the economy and the population was necessary to avoid the disastrous transgression of the physical 'outer limits' of the planet. The emergence of the concept of *sustainable development* in the 1970s, however, changed this position. The United Nations Environment Programme (UNEP) then introduced the concept of *ecodevelopment,* defined as 'development at regional and local levels... consistent with the potentials of the area involved, with attention given to the adequate and rational use of the natural resources, and to applications of technological styles ... and organizational forms that respect the natural ecosystem and local sociocultural patterns'.[11]

Clearly the flow of natural resources such as water, forests and energy, into production and consumption activities is crucial for most productive activities in developing countries and their availability determines the potential for growth. This constraint on growth is particularly binding for those developing countries that rely on the export of primary products. It tends to be seen in the form of rising costs and diminishing returns, rather than in a sudden loss of a resource base.[12]

Many investment projects cause environmental damage, particularly those in infrastructure, industry and even agriculture. They are likely to use new, more expensive, technologies, equipment and management techniques than the earlier ones. Safeguarding the environment may also require still more expensive choices and development options as countries approach the ecological and physical limits to the use of land and mineral resources.

The industries most heavily reliant on environmental resources and the most heavily polluting are growing most rapidly in developing countries, where there is both more urgency for growth and less capability to minimize damaging side effects. Energy generation in developing countries usually involves environmental degradation or resource depletion. Opposition to the depletion of resources and the

absence of other viable energy options usually delays energy projects, which are crucial for growth and development.

Militarization and poverty

The concept of militarization is very wide but I focus here on a specific aspect: the direct effects of military establishments on the economy and the environment. This includes the army during peace (its finance, weapons and equipment) and its effect during war (finance, destruction, etc). The effects of the political aspects of militarization (eg military intervention in politics) are not included.

Military establishments in developing countries play a complex role in the development process because of the prevailing high militarization levels and the continuous military intervention in economic and political activities. A rapidly rising military expenditure, particularly in Africa, has been accompanied by poor economic performance, poverty, and escalating wars and conflicts. Thus the relationship between military expenditure and development has become a relevant policy issue and area of study.

Unfortunately the economic impact of military expenditure in developing countries has been relatively neglected despite a remarkable growth in studies dealing with its impact in developed countries. However, the publication of data on military expenditure by some international organizations and the escalating trends of these expenditures in many developing countries in the last two decades have motivated quite a few empirical studies on the economic impact of military expenditure in developing countries.

The economic impact of military expenditure

Economic theory does not offer obvious predictions and postulates on the impact of military expenditure on growth and development, because economic theories do not provide a unique role for military expenditure as a distinctive economic activity. Even so, various connections can be identified. The emphasis in this section is on the impact of military spending on macro-economic variables, and economic growth in developing countries, particularly in Africa, rather than on economic development. This is because growth can be quantified and is a necessary but not sufficient condition for development.

Military expenditure influences economic growth through many channels, both directly and indirectly. Some major channels include the

indirect effects on human capital formation, savings and investment, and the balance of payments, as well as the direct growth-stimulating effects. These effects are interdependent and interrelated, but are treated separately here.

On human capital formation

People and their skills (human capital) are an important factor of production. Adequate human capital (including managerial, entrepreneurial and technical personnel) may increase the productivity of physical capital such as money, plant and machinery. In developing countries, a major obstacle to rapid economic growth has been the lack of skilled and educated people (well-developed human capital). Although the relationship between military expenditure and human capital formation is very complex, military spending can influence it directly by generating employment, increasing the supply of skilled labour, and indirectly through its effect on government spending on education and health.

Certainly the military mobilizes labour and offers employment. In most developing countries, soldiers come from villages and rural agricultural sectors, where they are either unemployed or underemployed, or do not have access to employment centres. These employment benefits to the economy are, however, limited by two considerations. First, only a small proportion of the population enters the army; and second, the military also frequently employs skilled labour, which is in short supply in most developing countries, and hence, reduces the amount available for civilian production.

Some economists argue that the military is an important source of technical and administrative skills which can subsequently be of use to the civilian economy and so stimulate growth.[13] It is also often argued that the organizational skills and modern attitudes and aptitudes of the military tend to break up social rigidities which inhibit human capital formation in developing countries.While the military does teach many skills, from driving and repairing vehicles, metal and woodworking, construction and improved agricultural techniques, to engineering and other sciences, especially in volunteer armies, these spin-offs should not be exaggerated.[14] Some of the skills taught in the army are military-specific and expensive, while the military often competes with the civilian sector for other scarce specialities (such as physicians and engineers). The transferability of skills is also not automatic because the trained personnel will not be available to the civilian sector for a large portion of their working life, particularly in the many developing

countries with volunteer armies. There is also no reason why the military should be intrinsically more modern than other civilian institutions in removing social rigidities.

Military expenditure affects human capital formation mainly through its impact on government spending on education. Given that both military and education spending come from the public purse and the upper limit on developing countries' budgets, there may be a one-to-one trade-off between military and education expenditures. Consequently, increases in military outlays may hinder the development of human resources by limiting the education budget.[15] Although the military provides independently services such as training, education and health, as one researcher concluded: 'Had some portion of the funds devoted to military training been directed towards civil-sector manpower formation, there can be no doubt that a larger number of people could have acquired skills directly useful to the civil economy'.[16] In some developing countries, increases in military outlays are at the expense of economic and other welfare services rather than education and health spending.[17] Furthermore, if the overall effect of military spending on economic growth is negative, then given the positive connection between growth and human capital formation, military expenditure exerts another indirect negative effect on human capital accumulation.

On the whole, then, the evidence suggests that the employment and technical spin-offs of the military are limited compared with the trade-off between military and education spending and, therefore, military spending has significant adverse effects on human capital formation.

On physical capital

Physical capital accumulation, that is, money available for investment, is an important ingredient in the growth process. It can be affected by military expenditure through a multitude of interrelated channels, but particularly through its impact on domestic savings and investment. In developing countries, this relationship is not straightforward as domestic savings are not automatically translated into productive investment; they might take the form of idle hoarding, be consumed wastefully or conspicuously, or be invested abroad.

Military spending affects the level of domestic savings directly and indirectly, and there is a considerable debate over whether the total impact is positive or negative. In developing countries, where the taxable capacity is limited by the dominance of traditional and subsistence sectors and low income levels, the option of raising revenues from

taxation is often not feasible. Budget deficits resulting from increases in military spending are usually financed by expanding the money supply through borrowing from the central bank. This leads to inflation and the impact of inflation on domestic saving is not clear-cut. It may lead to 'forced savings' or higher consumption and lower savings.

Rises in threat perceptions, however, caused by increases in military spending, may reduce savings (that is, by encouraging hoarding). Military expenditure also can reduce saving indirectly if it reduces government expenditures on health and education services and people have to use private savings instead. Overall, in developing countries, military expenditure is likely to reduce the saving propensity.[18]

While military spending can retard savings, this does not mean an equivalent reduction in investment. However, military expenditure can crowd out investment, especially in developing countries where government revenue and expenditure are generally inelastic.[19] In developing countries, supply bottlenecks can also prevent military expenditure from boosting output. In countries which do not produce arms, arms imports compete with imported investment goods for scarce foreign exchange and this hinders investment. Military expenditure can adversely affect human capital formation and this in turn affects the investment potential. Nevertheless, some infrastructural projects built by the military, such as roads or bridges, have spin-offs for the civilian sector but many of these projects are built in remote areas and do not suit civilian production. Overall, there are strong reasons to believe that the effect of military spending on investment is also negative.

On the balance of payments

Military expenditure in an open economy, especially in a non-arms producing country, leads to higher imports and deficits in the trade balance and the balance of payments. A surplus in the trade balance gives a stimulus to growth. The effects of arms imports on the economy depend mainly on the way these imports are financed, whether by outright grants or aid, payment in cash or kind, or credit finance.

In the 1950s and 1960s, outright grants prevailed as superpowers donated weapons to developing countries for political and strategic considerations. Countries which received foreign military aid had a lower burden on their trade balance. However, because of economic and trade difficulties in developed countries, military aid to developing countries has declined rapidly relative to more commercial transactions.

Weapons purchased for cash or kind have serious economic effects. Foreign exchange is very often in short supply in developing countries,

and this is made worse by costly arms imports. In Africa, for example, military expenditures set limits to the possibilities of growth. The most immediate effect is the diversion of resources to military installations at the expense of much needed capital goods for development. Clearly, the import of foreign weapons systems does not have any potent economic returns. Shortages in inputs and spare parts caused by shortages of foreign exchange also lead to further erosion of the existing production capacity.

Credit finance has to be paid back in hard currency, and possibly at high interest rates. This means less for investment. Military-related debts are quite substantial and add to the economic burden of weapons imports.[20] More fresh capital is needed to service the existing debt, which causes more foreign exchange shortages, and the 'debt trap' is reinforced.

Arms imports may also reduce savings indirectly because arms imports are usually exempted from imports tariffs and so the government loses revenue. Export capacity can also be reduced by past weapons imports or military expenditures which drew resources from civilian sector investments, again leading to a more precarious balance-of-payments situation.

It is often argued that weapon transfers might have some advantages, including technical spin-offs and the attraction of more economic aid, but the relevance of such spin-offs is questionable and evidence for the correlation between economic aid and military expenditure is weak.[21] Most military assistance programmes to Africa had some built-in destabilizing factors and were responsible for many military coups and resultant political instability.[22] In general military expenditure, and particularly arms imports, is a substantial burden on the balance of payments and economic growth.

On stimulating growth

As well as the various indirect effects of military expenditure on economic growth discussed above, it also has direct effects on growth. According to defence economists, military expenditure stimulates growth directly through increased capacity utilization, for example by increasing employment and demand. There is, however, no agreement on the volume and effectiveness of this. Benefits are probably small in poor countries because such countries' major problems stem from the supply side such as shortages of production inputs, and foreign exchange.

In many developing countries, technological spin-offs and the infrastructure developed by the army might bolster growth. The military may also guarantee a suitable environment for production to proceed by preserving internal stability and security. In African countries, the military engages directly in production activities: crop growing, food manufacturing and even commerce (for instance the Sudanese Military Economic Corporation). The military, many economists have argued, helps in the process of 'modernization' as it inculcates modern attitudes and the work ethos.[23] It also contributes significantly to 'nation building'. These factors are difficult to quantify in economic terms. Also it is important not to confuse the analysis of the economic impact of military expenditure with the impact of military governments on development.

Military expenditure has both direct and indirect effects on economic growth. However, the common simple analogy of the tank–tractor trade-off is not very helpful in understanding its impact because of the complexity and simultaneity of the channels through which these effects operate. Most recent studies have found evidence for the *negative* impact of military expenditure on developing countries' economic growth.[24]

Of four studies that focused on the African continent, one investigated the relationship between military spending and economic growth across 18 African countries for the 1965–1973 period but the results were not statistically significant.[25] Another assessed the impact of military expenditure on industrialization in 26 African countries from 1967 to 1976 and confirmed that military expenditure has an indirect negative impact on GDP manufacturing through both economic and social development factors.[26] A study into the growth-defence relationship for 39 sub-Sahara African countries from 1973 to 1983 found a small negative impact of the defence burden on growth.[27] My own study of 13 sub-Sahara African countries from 1967 to 1985 showed that it is difficult to establish a systematic relationship between military burden and economic variables for the whole sample because the effects of military expenditure on individual countries are different despite the relative homogeneity of the countries chosen.[28] In countries where the military burden was high and increasing, military expenditure had an apparent negative effect on economic growth, investment allocations, and human capital formation, and it contributed to huge balance-of-payments deficits; while in countries with low military burden, the positive spin-offs dominated this negative role. These positive and negative effects were balanced in countries with moderate

military burdens and therefore the total effect of military expenditure was negligible and insignificant. The overall evidence does, however, suggest that military spending hinders economic performance in most sub-Sahara African countries.[29]

Some studies found a negative trade-off between education and military spending in developing countries[30] but others concluded that military spending did not have negative consequences for education spending.[31] The discrepancies among these studies reflect the differences in their data bases, country samples and research designs or methods.[32]

Economic conditions and the militarization of society

Most conflict theories stress the importance of economic conditions in explaining conflict and conflict is one important aspect of militarization. For example, Homer-Dixon stressed the importance of economic factors in explaining civil strife and wars and the way different international, regional and national conflicts were motivated by economic factors is well-documented (for example the recent conflict in the Gulf).[33]

Empirical studies on the determinants of military spending confirm the importance of economic factors (such as level of income, government spending) in determining military allocations.[34] In my investigation of 13 sub-Sahara African countries, the differences in the military burdens appear to reflect a complex of economic, political and strategic factors, both at national and international levels. The need to maintain security and stability and to counteract threats was the most important factor in most countries. However, military spending was sensitive to economic conditions and the most important single economic factor was the share of the central government in GDP but not economic growth *per se.*

Most of the military coups in Africa were also said to be motivated by the desire to improve the deteriorating economic conditions, for example in the three successful military interventions in the Sudan in 1958, 1969, and 1989. Food shortages, drought, decrease in agricultural production and shortages in other human basic needs contribute to social tension, and consequently high militarization, of many developing countries. In summary, there are very strong theoretical and empirical grounds for a causal link between militarization (conflict or higher military spending) and economic conditions.

MILITARIZATION AND ENVIRONMENTAL DEGRADATION

The relationship between militarization and the environment has received very little scrutiny. Although some recent studies have shown the negative impact of military establishments and conflicts on the environment, the effect of environmental stress on social tension and conflict needs research. In this section, I focus on the effects of military establishments on the environment first in peacetime and then in war.

Peacetime effects

Armed forces are established to defend national unity and deter foreign aggression. However, many researchers describe them as the 'great polluters' in modern societies. The armed forces contribute, both directly and indirectly, to environmental degradation in many ways.

Direct effects

These include:

- Expropriation of vast areas of land for military training, installations and manoeuvres, which could have been used for cultivation or other economic activities. Military activities damage wildlife habitats, forests and soil stability, particularly through the movement of heavy and armoured equipment and the discharge of toxic wastes.
- The spread of arms production.[35] The production and testing of conventional weapons generates harmful wastes that cause environmental damage – a situation made worse in the Third World because of minimal safety standards.
- Military establishments are great consumers of resources including petroleum, minerals, chemicals, as well as agricultural products. For example, military aircraft consume half of all aircraft fuel.[36] In addition, arms production is increasingly dependent on non-renewable resources (for example uranium, titanium and chromium).
- Preparation for war, and sometimes routine activities, involves mobilization of forces and a high military presence in certain areas which is usually accompanied by the massing of equipment and arms. This damages local environments and generates extensive wastes (sewage and solids). [37]

- The military share in the destruction of the ozone layer and the greenhouse effect is substantial.

Indirect effects

These include:

- High militarization and military spending, particularly among developing countries, incur substantial economic costs. Their negative impact on economic growth contributes to widespread poverty which is one of the most significant factors threatening environmental security.
- Increases in military spending usually take place at the expense of other categories of government expenditures, which includes environmental conservation projects.
- The military competes with the civilian sector for human resources. Of the total population, only one per cent works in the military sector but more than 20 per cent of all scientists and engineers are employed by the military.[38] The opportunity cost of this human resource capital on the civilian economy and the environment is substantial, particularly in developing countries where the lack of well-developed human capital is perhaps the most significant constraint on economic growth and development.

While the military clearly does contribute to environmental degradation in peacetime, consensus on the volume of such degradation is not universal but it is believed to be more than the military's share in national product.[39] There are, however, some positive effects of militarization on the environment. In many countries, particularly in Africa, the military fight harmful environmental activities such as hunting or cutting down forests. The Kenyan army, for example, has anti-poaching squads for protecting wildlife.

Wartime effects

War causes enormous direct damage to the environment, and puts pressure on the environment indirectly through its displacement of people, who in turn put stress on neighbouring environments.

Modern wars employ defoliants, high explosives, biological agents and weather modification techniques; they also involve land, air, water and space. The use of weapons of mass destruction has grave environmental consequences. Major technological developments have also greatly increased the mobility of conventional arms and the range

of their firepower. The Gulf War provides an example of how the destruction of resources (burning oil fields) can be used as a military tool.

Indirect effects include the fact that soldiers and warfare play a significant role in the spread of diseases. There is evidence that war plays a role in the spread of Aids and other sexually transmitted diseases, for example in the geographical pattern of clinical Aids in Uganda.[40]

The effect of environmental factors on militarization

The environment also affects militarization, although the impact of environmental factors on conflict and militarization has received little attention by researchers. Comprehensive human security has two components. *political* security and *environmental* security.[41] Different environmental factors give rise to conflict and, consequently, military actions at the national, regional or international levels. These environmental factors can lead directly to conflict, or indirectly through their effects on other factors.

Direct effects

There are two kinds of environmental threats: those which arise from vandalism, excessive pollution and human intrusion; and those which arise from the non-sustainable utilization of resources. Thus, protecting the environment – and natural and human resources – is one of the most important security goals of all governments.

Competition over natural and scarce resources has been the most important factor in arms races and the outbreak of wars. The World Commission on Environment and Development (WCED) concluded that:

> Environmental stress is both a cause and an effect of political tension and military conflict. Nations have often fought to assert or resist control over raw materials, energy supplies, land, river basins, sea passages, and other key environmental resources. Such conflicts are likely to increase as these resources become scarcer and competition over them increases.[42]

Examples of such resource conflicts include *land* – the Libyan-Chadian conflict over Ozou strip; *raw materials* – the Sudanese-Egyptian conflict over Halayeb area; *energy* – oil supplies from the Gulf; *water* – conflict between Syria and Turkey over the Ataturk dam; and *food* – tribal conflicts in many parts of Africa.

Many countries are already poised for conflict on these issues. It is not a new phenomenon. The quest for territorial expansion to secure resources and trade routes to benefit one or a group of nations has often generated conflict in the past.[43] Environmental conflict arises between countries within the same ecogeographical region (Israel-Jordan, Turkey-Syria, Sudan-Egypt-Ethiopia, Iraq-Iran, Iraq-Kuwait, and so on).

Environmental degradation, pollution, and over-use of common resources such as water, cause conflicts which can lead to wars,[44] or exacerbate conflicts that have other root causes.[45] One example is the direct threat to Syria from the inevitable loading of fertilizers, pesticides and salts that will be transported down the Euphrates as a result of Turkey's agricultural and irrigation efforts in South East Anatolia (GAP) project. These might cause further risks to downstream states (Iraq) and the Gulf ecosystem.[46] Another example is the potential for conflict over the Nile water between Egypt, Sudan and Ethiopia. The present Secretary-General of the United Nations, Dr Boutros Boutros Ghali, warned in the mid-1980s about the potential for conflict here, saying, 'The next war in our region will be over the waters of the Nile, not over politics...'.[47]

Apart from regional conflicts caused by environmental factors, global environmental concerns such as global warming or ozone depletion have an increasing potential for prompting international conflict and are an important factor in international relations.

Indirect effects

Population dislocation and the economic problems caused by environmental degradation are the most important indirect ways in which environmental stress causes social conflict.

Population dislocation caused by environmental change, such as drought or desertification, creates the problem of refugees. If people living in a depleted country see no prospect of feeding themselves they will start to move to better placed areas. This creates a population influx which, in most cases, exceeds the capacity of the host environment and creates conflict and competition over resources. Armed conflict and banditry in western Sudan is an obvious example of this. Political systems may also be threatened by the influx of refugees as they put pressure on the services in cities and cause food shortages. Food riots and urban violence become a danger to national governments, particularly in Africa. Population shifts may also raise the level of tension between countries, for example in Africa where the conflicts between Sudan and Chad, and Sudan and Uganda, in the late 1980s were clearly

made worse by environmental refugees crossing interstate boundaries.

Environmental degradation also affects the economy, particularly in Third World countries which depend mainly on natural resources for their exports and local consumption. The WCED emphasized that 'already in parts of Latin America, Asia, the Middle East, and Africa, environmental decline is becoming a source of political unrest and international tension'.[48] People in the affected areas have lower incomes and degrade the environment further in an attempt to survive or move, putting pressure on other communities or cities. This is a cycle of decline which may precipitate tensions, food riots or armed conflicts.

Some researchers are trying to understand these environmental influences on conflict. Homer-Dixon argues that there are seven clusters of environmental problems:

1. greenhouse warming;
2. ozone depletion;
3. deforestation;
4. acid rains;
5. degradation of land;
6. overuse of water supplies; and
7. depletion of fish stocks.

These problems produce four general types of social effect – decrease in economic productivity, changed agricultural production, population displacement, and disruption of institutions and pattern of social behaviour. These in turn lead to three types of conflict: frustration conflicts, identity conflicts and structural conflicts.

Frustration-aggression theories of conflict suggest that people become hostile when they perceive a wide gap between the level of satisfaction that they have achieved and the level they believe they deserve. Group-identity theories explain conflicts involving ethnicity, religion and nationalism: individuals have a need for a sense of belonging that can be satisfied in a group when it attacks or discriminates against another group (for example the Muslim–Hindu conflict in India). Structural theories explain conflicts as arising from the rational calculations of actors in the face of external social or material constraints.[49]

ESCAPING FROM THE DEVELOPMENT TRAP

So far we have discussed the alarming trends of poverty, environmental

degradation and militarization in developing countries, their close interlinkages and their re-enforcement on each other. Deteriorating economic conditions can lead to social conflicts and higher militarization; high levels of militarization contribute significantly to environmental degradation; degraded environments limit economic growth and consequently increase the levels of poverty. Conversely, high militarization has a substantial economic cost, restricts economic growth and thus increases poverty; poverty leads to environmental stress and degradation; the environment itself is a major source of conflict (and consequently high militarization). This is what I have called *the development trap*. The great challenge is to find a way out.

All developing countries seek to achieve rapid economic growth and development, to preserve their natural environments, and to secure political stability, national unity and their territories. They need to achieve *sustainable development*. Yet economic development in developing countries cannot be achieved in isolation from international developments. Both national and international policies are recommended here for the realization of sustainable development.

International policies

- The restructuring of global economic relations in such a way that developing countries can obtain the required resources, advanced technology and access to markets, to enable them to pursue a development process that is environmentally sound and also leads to rapid growth to meet the aspirations of their growing populations. The developed countries must contribute through debt relief, increasing economic assistance, technology transfers and new approaches to trade.
- The 'peace dividend' resulting from the end of the Cold War should be used to finance development cooperation and international programmes to respond to global environmental threats.[50]

National policies

- Developing countries should put human rights, democratization of political institutions, and confidence-building measures at the regional level, as their first priority This will reduce both national and regional conflicts which have significantly damaged economic growth and environmental conservation.

- Poverty elimination should receive a very high priority in governments' policies and development plans. Of course the elimination of poverty is not an easy task but there are various strategies available.[51]
- Environmental conservation should be incorporated in all development plans in developing countries. National governments also have to provide adequate environmental education for their populace.
- Population policies in all developing countries are necessary to curb rapid population growth. Improving health services, introducing family planning methods and contraceptives, increasing the age for marriage, and education are all helpful tools to reduce high fertility rates.
- There is a growing need for the *conversion* of military capabilities, personnel, production and technologies.

Most of the above policies are long term. To implement them requires huge resources and a great deal of international cooperation. However, the end of the Cold War, changes in the balance of power between the eastern and western blocs, and the changes in Eastern Europe have provided developing countries with an enormous potential to escape from the vicious development trap by the conversion of military resources and capabilities to civilian uses.

Conversion

The key threats facing the world are poverty, environmental degradation and the growing internal conflicts in Africa, Asia, Eastern Europe and the former Soviet Union. The end of the superpowers' rivalry has provided many Third World countries with opportunities for reducing their military spending levels. This peace dividend should be used to fund a structural adjustment and conversion programme and investments in critical human, environmental and infrastructural needs. The reducing of military spending and conversion has been the subject of considerable research and interest over the years, both in the developed and developing countries.[52]

Despite being a rather vague concept, conversion is commonly understood as 'the transformation of military resources into civil activities and production'.[53] It means more than simply the reduction of military production; it involves a structural rebuilding of the national economy and its productive sectors. Thus conversion is a simultaneous

and integral part of arms reduction efforts, because the employment creation potentials of conversion can outweigh the anxieties of unemployment due to arms reduction.

There have been three broad approaches to conversion:[54]

1. *Macroeconomic* – this focuses on the negative relationship between arms spending and economic growth, and emphasizes the macroeconomic benefits from the conversion of the defence industrial base to civilian production. Therefore, cuts in military spending will result in a tangible 'peace dividend'.
2. *Microeconomic* – this focuses on company or plant-based conversion, which involves the re-use or transformation of existing military resources to civilian purposes. A related strategy is diversification, in which defence industries attempt to minimize their vulnerability to defence market fluctuations by engaging in non-military production in addition to their existing military production. This approach has not been particularly successful, partly because of the differences between commercial and military production criteria and cultures. Some suggested reasons for this failure are that microeconomic conversion focuses on products rather than process innovation and this tends to reinforce industrial and technological patterns of production rather than transforming them. As such, it is a missed opportunity for a more broad-based economic restructuring.[55]
3. *Political* – this emphasizes the transformation of resources tied up in defence production within a broader socio-economic and political context. It is not as narrow as the economic approaches, and encompasses the demilitarization of society, for example demobilization and reduced defence expenditure. Conversion is seen as an opportunity or lever to effect changes in the structure of society, and to challenge existing industrial and technological priorities and the social relations of production inherent in military activities. This approach recognizes the need for a plan to meet basic human and environmental needs, and the urgent requirement to shift national resources away from military-defined objectives to national needs such as industrial renewal, environmental restoration, sustainable economic development, social investment and renewable energies. Such a national needs policy, although initiated by government, should operate in partnership with industry, finance and local and regional authorities, workers and consumers.[56]

Conversion can help developing countries to escape the development trap by its immediate impact on the economy, the environment, and its reduction of high militarization levels. It can achieve its goals in a short time and at modest costs.[57] Converting conscripted labour is almost without cost because conscripts can return to their regular professions. Most conventional weapons can be disarmed fairly simply, and can be stored at very low cost. Many military land areas can be reclaimed for civilian use after minimal cleaning up. The extreme cases and obstacles to conversion do not apply to most developing countries as most do not have nuclear, biological or chemical weapons or well-developed arms industries.

Conversion provides huge potentials for environmental conservation, both by better use of resources for the development of a sustainable environment, as well as the clean-up of the environment already ruined by military activities. Conversion can also assist environmental conservation in the areas of environmental monitoring, chemical analysis, cartography, medicine, microbiology and radiology, besides the deployment of members of the armed forces for disaster relief and other emergencies.[58] However, transferring resources from military to civilian use will not automatically bring about environmental improvements unless such aims are built into the conversion process.

Conversion also provides an opportunity for economic development plans aimed at countering poverty. The reallocation of resources from military to civilian sectors should take place both domestically (within developing countries) and internationally.[59] Although there are a number of political, institutional, economic and technological problems associated with disarmament and adjusting to lower levels of military spending, not all of them apply to developing countries, and particularly Africa.[60] An important overall problem with conversion of defence industries, irrespective of the country involved, relates to the nature of the military industrial production process. This involves manufacture of a product for one major customer (usually the Ministry of Defence) which is based on 'a performance at any cost' principle, and has a product development culture which is determined by the inherently closed nature of military secrecy.[61] In Africa this is relevant only for Egypt, South Africa and Nigeria, where the military industrial base is well-developed. These form significant barriers of entry to, and exit from, the defence market. When added to the obvious adjustment costs at industry, company, regional and local community levels associated with restructuring or converting defence industries, they provide some of the reasons why very few countries have fully succeeded in converting defence industries to civil production.

Unemployment is usually cited as the real obstacle to reducing military spending and conversion. But this can be solved if the released resources are directed to productive civilian projects which create jobs, or other areas of public expenditure. Other barriers facing conversion include managerial reluctance to convert; the specific nature of the military product concept; the closed organizational culture surrounding military production; and the vested interests of the 'military industrial complex'.[62]

Nevertheless, the evidence suggests that developing countries *can* achieve reductions in military spending and implement conversion policies, and that this process of demilitarization has significant long-term economic benefits. This is true for most developing countries, and particularly African countries, because of the absence of military industries, which means that there are fewer economic and technological obstacles to conversion. What is needed is proper planning for conversion, and strategies for the use of military personnel and military facilities (such as airports) during peacetime in civilian projects.

Regional confidence building and cooperation among developing countries is also needed if military reduction and conversion policies are to become a reality. The developed countries must play an important role by making drastic reductions in arms trade, and supporting an international register of arms exports and production. In conclusion, reductions in military spending and the conversion of defence industries represent an economic opportunity rather than a problem.