

Environment, Conflict and Security: Emerging Scenarios and Implications for Sustainability

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Abstract: There is a direct correlation between environmental degradation and conflict. Environmental degradation can and does trigger, amplify or cause conflict and instability. There is also increasing problem of environmental refugees. Growing environmental pressures may also soon create insecurities and possible conflict in countries of China, India and Brazil. It is likely that force may be used in response to transboundary pollution, or to enforce international environmental law. Conflict can be a constructive force calling for institutional change. Environmental degradation and resource scarcity put pressures on existing institutions. All possible efforts will be made to bolster and adapt institutions to manage conflict effectively. Reducing poverty, strengthening the state and civil society, and promoting human rights will do more to enhance security and ensure peace. Awareness of linkages among environment, conflict and peace may help development agencies provide assistance that supports other policy objectives. Environmental degradation and peace are critical components of a fragile situation but important bridge between the development and security communities. Both have an opportunity to promote economic well being, social stability and environmental sustainability by strengthening that bridge. With above backdrop, an attempt has been made to explore the linkages among environmental change, conflict and security and to suggest policy recommendations addressing some urgent contemporary environmental and security problems in the context of sustainability and development.

Key words: Conflict; environment; environmental degradation; peace; security.

1. Introduction

Since Second World War, the desire to prevent a third world war has remained a primary concern. New initiatives have been made to achieve this objective, which involved transforming colonies into sovereign states, increasing economic openness, and creating robust regional and international organisations. However, just after two years, the Cold War emerged and dominated the international agenda. Security was conceived in terms of neutralising military threats calling huge defense expenditures.

In contemporary world, the proliferation of weapons of mass destruction, the expansion of democracy, the rise in world trade, and the evolution of regimes and other multilateral forms of governance have been considered potent to reduce the incidence and probability of interstate war especially in Europe and the Americas. Therefore, likelihood of a world war is decreased. The greatest threats to peace and security are domestic (poverty, inequity, civil war and state-sponsored violence) or transnational (transnational crime, terrorism, disease and environmental degradation). Enhancing peace and security requires expanding focus from the threat of external aggression to those posed by internal and transnational forces. The military threats have not disappeared or diminished. The denial of nuclear weapons to Iraq and the destabilising arms race between India and Pakistan are recent cases demonstrating the presence of military threats. However, addressing internal and transnational peace and security and threats requires skills and resources ordinarily not available with military. Therefore, identifying new threats and vulnerabilities and providing

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the required skills and resources to analyse and address them is prime security concern.

Environmental stress is emerging as a major threat to peace and security in the developing world. There is a direct correlation between environmental degradation and conflict. Thousands of people in the Ethiopian highlands would not have left the environment of their ancestors had resource mismanagement not obliged them to do so. With rapid population growth and shrinking environmental resources, there are conflicts between Hutu cultivators and Tutsi pastoralists. There is increasing problem of environmental refugees due to war between Honduras and El Salvador. Israel's pledge to hold onto large parts of the West Bank has more to do with control of water resources than fears of a hostile Palestinian neighbour. Growing environmental pressures may also soon create insecurities and possible conflict in countries of China, India and Brazil.

During recent past, the relationships among environmental change, conflict and peace have received considerable attention. The concept of security is expanding from narrowly militaristic understandings of threat, vulnerability and response mechanisms due to new challenges posed by technological innovation, economic globalisation and environmental degradation to human welfare and security; decline in the incidence and probability of interstate war owing to economic interdependence, and democratisation and the end of the Cold War. Environmental degradation can and does trigger, amplify or cause conflict and instability. The security institutions are being called upon to protect access to environmental goods and the global commons. It is likely that force may be used in response to transboundary pollution, or to enforce international environmental law. Conflict can be a constructive force calling for institutional change.

Environmental degradation and resource scarcity put pressures on existing institutions. All possible efforts will be made to bolster and adapt institutions to manage conflict effectively. Reducing poverty, strengthening the state and civil society, and promoting human rights will do more to enhance security and ensure peace.

The military and intelligence assets are being used to collect environmental data and assist in the implementation of environmental initiatives such as reforestation. Military establishments discuss the threats posed by environmental degradation, share information and technology, co-operate in cleanup activities, and develop collaborative response mechanisms to environmental crises and conflicts. Awareness of linkages among environment, conflict and peace may help development agencies provide assistance that supports other policy objectives. Environmental degradation and peace are critical components of a fragile situation but important bridge between the development and security communities. Both have an opportunity to promote economic well being, social stability and environmental sustainability by strengthening that bridge. With above backdrop, an attempt has been made to explore the linkages among environmental change, conflict and security and to suggest policy recommendations addressing some urgent contemporary environmental and security problems in the context of sustainability and development.

I. Linking Environment, Conflict and Security: Evidence from Literature

Environmental change can significantly increase vulnerability to climate change. Demographic pressure, resource degradation, and inequitable access to resources are likely to worsen due to violence and instability. Ecosystem degradation is posing the greatest challenges in achieving the Millennium Development Goals (MDGs) in developing countries. Environmental programmes and initiatives are often open to development agencies in conflict situations. The availability of environmental resources can also have profound effects on societal stability. Control or access rights may be insecure or inequitable even where the resource is not scarce (Ross, 2004; Homer-Dixon, 1999; Dalbelko, et al., 1999).

In conflict zones, the valuable "conflict" commodities (like oil, diamonds, timber, illicit drugs) can prompt competition between groups for access or control, which can cause, trigger or, more often, drive and prolong conflict due to potentially huge rewards that can be derived from controlling such resources. The

availability of “conflict” commodities, however, does not lead inexorably to conflict. The process of controlling, managing and distributing the resulting revenues shapes the dynamics of conflict and peace. Low or declining resource availability can have a profound impact on livelihoods and societal relations. Destabilising impacts can be caused or compounded by environmental damage or degradation. Similarly, conservation and sustainable management activities may inadvertently cause or exacerbate instability. Social inequalities, governance failures, a rapid rise in economically marginalised people, and the involuntary need of those marginalised to utilise the resource unsustainably are critically linked (SIDA, 2000).

i. Environment change and conflict

Global environmental change is a security issue (Brauch, 2003; Cassils, 2004; Diamond, 2005; Homer-Dixon, 2000; Renner, 1996). Growing environmental scarcity perpetuates underdevelopment and promotes conflict (Wackernagel & Rees, 1996; WWF, 2004). Indicators of environmental pressure, sustainability and degradation are not uncontroversial (Neumayer, 2004). There are numerous complications in conducting research in the area of environment and security (Dokken & Graeger, 1995; Lipschutz, 1995; Deudney & Matthew, 1999). Homer-Dixon (1991, 1994. and Libiszewski (1992) have concentrated on the role of environmental change and resource depletion as potential causes of violent conflict. Levy (1995a) explored the nature of security and the role of environmental degradation as a contributor to insecurity and conflict. Levy (1995b) attempted to prove a link between environment and conflict.

Empirical studies by Homer-Dixon (1991, 1994. Homer-Dixon *et al.*, (1993. Libiszewski (1992. Spillman & Bachler (1995. Molvær (1991. Lodgaard & Hjort af Ornas (1992. Græger & Smith (1994. Dokken & Græger (1995. Durham (1979. Westing (1986. Gleick (1989, 1991. Lonergan & Kavanagh (1991) have been crucial in explaining the links between environmental change and violent conflict. Many studies focused on environmental scarcity rather than on environmental degradation. Homer-Dixon *et al.* (1993) reveals that “...scarcities of renewable

resources are already contributing to violent conflicts in many parts of the developing world.” Bachler *et al.* (1998) demonstrated that environmental degradation and resource depletion may play roles in affecting security and contributing to conflict. Deudney (1991), Dalby (1992), Conca (1994), Levy (1995a, 1995b) have been critical of deterministic perspective on environment and conflict and focused largely on inter- and intrastate violent conflicts and state security.

Constraints on resources are a crucial factor to contribute to insecurity and to produce conflict as well (Choucri, 1991). The competition for resources has historically been a major cause of conflict (Ullman, 1983). Lipschutz (1995) emphasized the importance of resources and the environment as contributors to conflict. Atmospheric change - both global warming and ozone depletion - has the potential to cause significant societal disruption (Myers, 1993). Homer-Dixon (1994) concludes that environmental scarcity causes violent conflict.

The resource scarcity, human rights abuses, outbreaks of infectious disease, and environmental degradation caused by toxic contamination, ozone depletion, global warming, water pollution, soil degradation and the loss of biodiversity are non-conventional threats to peace and human security (Ullman, 1983; Renner, 1989; Westing, 1989). Environmental change and security are closely linked (Osborn, 1953; Brown, 1954; Sprout & Sprout, 1971; Ophuls, 1976). Environment change will increasingly have dramatic impacts on ecological and social systems (IPCC, 2001, 2007). These impacts have been serious threat to peace and security (Barnett, 2003; Barnett & Adger, 2003; Brown, 1989; Edwards, 1999; Swart, 1996). Environment change may increase the risk of violent conflict (Gleick, 1992; Homer-Dixon, 1991; van Ireland *et al.*, 1996). Conflict might be stimulated by environment change through changes in the political economy of energy resources (Rifkin, 2002) and changes in social systems due to actual or perceived climate impacts (Alkire, 2003).

ii. Environmental change and human security

World Commission on Environment and Development (WCED) called for recognition

that security was partly a function of environmental sustainability. WCED highlighted the causal role environmental stress in contributing to conflict. Comprehensive security has two intertwined components: *political* security, with its military, economic and humanitarian sub-components, and *environmental* security, including protecting and utilising the environment (Westing, 1989). Security is needed to be understood at levels regional or global and community or eco-region (Matthews, 1989). The state was no longer privileged as the only meaningful object to be secured (Buzan, 1991).

There is need to broaden the concepts of security (Matthews, 1989; Myers, 1989) by including a new range of threats such as population growth, resource scarcity, and environmental degradation. Myers (1993) equated security with human wellbeing, which includes not only protection from harm and injury but access to water, food, shelter, health, employment, and other basic requisites. Many researchers avoid using the term security altogether and prefer to focus on environmental change and social adaptation and/or armed conflict. Contemporary climate change system has no precedent in the history of human civilization (IPCC, 2007; Stern, 2007). Environmental change poses risks to human security (McCarthy et al., 2001). Impacts of climate change have been observed on social-ecological systems (Oppenheimer & Alley, 2004; Schneider et al., 2007). Famine is triggered by drought but caused by political and economic colonisation of deprived people of their entitlements to natural resources (Davis, 2001). Poverty, inequality, market failures, and policy failures are deeper causes of 'natural' disasters (Sen, 1981; Webb & von Braun, 1994). Environmental change also causes famine and natural disaster (Diamond, 2005).

Environmental change does not undermine human security in isolation from social factors. Climate change can and does undermine human security. In times of low rainfall, food production can be reduced significantly, resulting in widespread hunger and child malnutrition (Barnett et al., 2007). The focus of human security is individual. The processes, which undermine or strengthen human security is often external to the locality

of communities where individuals reside. Social and economic entitlements are necessary to reduce an individual's vulnerability to environmental changes (Adger & Kelly, 1999).

Climate change may also be a national security issue (Barnett, 2003. which may be both a cause and a consequence of human insecurity. Therefore, human security is a function of multiple processes operating across space, over time, and at multiple scales. It is difficult to find the ways in which climate change may affect human security. Indeed any existing environmental changes can be attributed to climate change (Allen & Lord, 2004). The relationship between climate change and human security is significant (Adger, 1999; Bohle et al., 1994; Liechenko & O'Brien, 2002). Marginalised people are vulnerable to environmental change. Environmental change can be a significant factor that undermines human security. Climate change poses significant risks to human security in many parts of the world (Minnegal & Dwyer, 2000; Chambers, 1989; Blaikie et al., 1994; Matthew, 2001; Najam, 2003; Mochizuki, 2004; Cocklin & Keen, 2000; Haile, 2004). It is also difficult to find the ways in which human insecurity lead to violent conflict. Violent conflict is itself a powerful cause of human insecurity and vulnerability to climate change (Barnett, 2006).

iii. Violent conflict and security

Violent conflicts research focus on 'greed versus grievance' debate (Berdal & Malone, 2000). Violence happens due to the presence of a weak state (Eckstein & Gurr, 1975) and the 'lootability' of natural resources (Collier, 2000). Individuals choose to engage in both violence and peace (Cramer, 2002; Gilgan, 2001; Moran & Pitcher, 2004). Human insecurity increases the risk of violent conflict (Gough, 2002; Mochizuki, 2004; Ohlsson, 2000). Armed conflict occurs due to contractions in livelihoods of youth (Ohlsson, 2000). Poor men may have a 'comparative advantage' in violence because the opportunity costs of joining armed groups are low (Goodhand, 2003). The opportunity costs for women are relatively higher due to their reproductive and domestic obligations (Ohlsson, 2000). Perhaps, women are often the most important actors in peace-building

endeavours (Mochizuki, 2004; Moran & Pitcher, 2004).

The risk or realisation of sudden poverty increases people's propensity to join armed groups (Goodhand, 2003; Nafziger & Auvinen, 2002; Ohlsson, 2000). The perception of future insecurity increases the risk of violent conflict (Stewart & Fitzgerald, 2000). The provision of aid can help reduce the need for people to use violence to provide for their needs (Gough, 2002; Keen, 2000). Declining access to natural capital causes livelihood contraction and increases the risk of joining armed groups (de Soysa et al., 1999). Population growth may be a contributing factor in declining livelihoods (Hartmann, 1998). Violence tends to increase impoverishment (Bax, 2002). Climate change will result in contracted livelihoods. Collier (2000) finds no strong association between income inequality and civil wars. Inequalities are a cause of grievance (Archibald & Richards, 2002; Cramer, 2003; Goodhand, 2003; Hage, 2003; Keen, 2000; Reno, 1997; Stewart, 2000).

Education offers the opportunity for people to improve their lives. Poverty of opportunities has been a major factor to join militias for particularly young men (Archibald & Richards, 2002; Keen, 2000; Hage, 2003; Maclure & Sotelo, 2004). The psycho-social needs are also met by joining armed gangs and often give sense of power and status (Goodhand, 2003; Keen, 2000. social mobility (Stewart & Fitzgerald, 2000. excitement (Keen, 2000. and social recognition (Hage, 2003; Maclure & Sotelo, 2004). Other motivating factors are a genuine sense of grievance, frustration, and desire for revenge (Archibald & Richards, 2002; Scheper-Hughes, 2004. identification with a common cause and protection from violence and denial of economic freedoms (Keen, 2000; Mwanasali, 2000).

Human insecurity increases the risk of violent conflict (Galtung, 1969). Climate change may also increase the risk of violent conflict. Livelihood security seems to be an important factor in security from violence (Gough, 2002). The states are involved in the causes of and solutions to violent conflict (Kahl, 2006; Reno, 2000) by creating the conditions to pursue the lives the people value (Sen, 1999). Strong states are more capable of

managing environmental degradation and change (Eckstein & Gurr, 1975; Esty et al., 1999; Hauge & Ellingsen, 2001; Kahl, 2006). In the absence of strong functional states, the risk of violent conflict increases and the revenue raising opportunities for the state are constrained (Nafziger & Auvinen, 2002). Environmental change can be a factor in state failures due to its impacts on revenue, legitimacy and social cohesion (Kahl, 2006). The state functions seem to be of particular importance to mitigate generation of violent conflicts (Goodhand, 2003; Gough, 2002; Kahl, 2006; Keen, 2000). Groups who live beyond the protection of the state are often more likely to experience violent conflict (Keen, 2000).

Where states actively deny entitlements, or deliberately repress and abuse people, violence becomes a more likely tool of resistance (Nafziger & Auvinen, 2002). Inadequate distribution of the returns from resource extraction activities has been a factor in violence (Peluso & Harwell, 2001; Mochizuki, 2004; Watts, 2001). When states contract due to Structural Adjustment and Good Governance Programmes, the freedoms and opportunities subsequently contract and violent conflict is more likely (Bax, 2002; Bobrow-Strain, 2001; Gough, 2002; Gourevitch, 1998; Kahl, 2006; Keen, 2000; Reno, 1997). Other factors that increase violent conflict include availability of weapons (Boutwell & Klare, 1999. history of violent conflict (Collier, 2000. resource dependence (de Soysa, 2000. youth bulge (Cincotta, 2004) and in-migration causing 'environmental conflicts' (Baechler, 1999; Klotzli, 1994; Peluso & Harwell, 2001; Swain, 1993). Large migrations lead to violent conflict and may be a consequence of climate change (van Ireland et al., 1996). The political and institutional responses to new migrants seem to be most important factor in violent conflict (Goldstone, 2001). Most potentially devastating impacts of climate change arise from multiple stresses including ecosystem degradation, failed governance systems, and economic decline (Leary et al., 2006).

iv. Environment security and conflict

The use of environmental resources is apparently progressing at unprecedented rates (MEA, 2003; Vitousek et al., 1997). Environmental security is integrated into

broader concepts of security (Panyarachun, 2004) or human security (Page & Redclift, 2002). Good environmental stewardship relates to peace and human security. 'Environmental stresses heighten tensions, leading to possible conflict' (MEA 2003: 79). Increase environmental scarcities due to the global effects of climate change results in conflict as a possible scenario (Schwartz & Randall, 2003). There is growing theoretical debate on the environmental conflict issue (de Soysa, 2005; Gleditsch, 1998, 2003). With scarce resources, people will fight for survival (Homer-Dixon, 1999; Renner, 1996). Environmental decline could lead to collapse. The collapse of Rwanda, Somalia, and Haiti are highlighted for their ecological scarcities more than economic, cultural, and political issues. Ecological collapse is the ultimate source of other failures. Thus, climate change may exacerbate the underlying ecological conditions that determine social failure and collapse (Diamond, 2005).

Environmental degradation poses periodic challenges to human well-being. In overcoming scarcity, the role of new technology, human ingenuity, market pricing, and cooperation is not over-emphasized (Lomborg, 2001; Simon, 1998). Due to lack of societal pressure, resource-abundant countries fail to adopt best practices in economic and political life (Boserup 1965). Natural resources may be even a curse rather than a blessing (Ross, 1999; Sachs & Warner, 2001). Environmental scarcity causes violent conflict (Homer-Dixon, 1999). There is strong links between environmental scarcity and internal violent conflict (Hauge & Ellingsen, 1998). A society needs ingenuity to deal with environmental scarcity, which acts as constraints on innovation. An 'ingenuity gap' develops because society is unable to deal with environmental scarcity, leading to social disarray and conflict. Scarcity is a barrier against the production of ingenuity and adaptation to economic hardship (Lal & Myint, 1996; Ross, 1999; Sachs & Warner, 2001).

Auty (2001, de Soysa (2005, and Ross (1999, 2004a, b) see natural wealth directly fuelling economic failure, corruption, and conflict. Natural resources motivate rapacious behaviour and allow the finance of civil war (Collier et al., 2003). Most durable conflicts in Sub-Sahara Africa are fueled by the struggle

for control of oil, diamonds, timber, and other resources. Greed is a major reason for civil war as opposed to injustice and other grievances (Fearon, 2005). Countries that derive bulk of their exports from oil double their risk of conflict (Fearon & Laitin, 2003). Resource-wealthy states are institutionally weak because resources, and not people, become the primary tax base. Large rents from natural resources hamper state capacity and socio-economic progress and directly linked to conflict (Lujala et al., 2005).

II. Emerging Scenarios and Implications for Sustainability

Competition over control, use and access to non-extractive resources (common land or water) is most likely to generate violence at the local level. In turn, conflict can exacerbate scarcity when fighting decimates forests and agricultural land and poisons water sources. The impact of large movements of people on resource access and use and/or degradation needs to be mitigated and managed so that it does not fuel the recurrence of violence. The nexus of environment, conflict and peace exist on multiple levels. It concern distinct but overlapping constituencies like governance, rural livelihoods, private-sector development, gender equality (El-Bushra, et al., 2002; Pearl, 2003; Collier, et al., 2003) with varied implications for development agencies, governments and the international community.

i. Integrating environmental education and peace education

Environmental education (EE) and peace education (PE) are closely linked. EE and PE share common aims, topics and approaches. Two major challenges are needed to be dealt with from educational perspective: the complexity of current conflicts and growing economic inequalities. PE can be defined as an educational process that encourages people to view conflict as a fundamental part of society and to analyse the roots of violence. One of the main aims of PE is to address the complexity of conflict and to turn it into an educational tool. Besides, attaining sustainable development at the planetary level is one of the keys to achieving peace. EE could contribute to this aim. In the field of PE, conflict is considered a natural and necessary process in all human societies, not always related to explicit

violence. It is one of the motivating forces behind social change and an essential creative element in human relations. It can be a positive or destructive factor in change and relationships, depending on how it is managed.

ii. New opportunities for research

There is need for fine-grained, micro-level analysis of environment and security linkages to clarify the precise nature of correlations revealed by quantitative analysis. Micro-level analysis could also reveal how individuals and groups cope with environmental change through adaptation, mitigation, and exit strategies. Micro-level analysis is needed to uncover the links among natural resources, livelihoods, access to resources, and violent conflict which integrates micro needs to macro policy initiatives. Is it possible that the environmental effects of conflicts are not always as severe as commonly assumed? What does this imply for conservation efforts during conflicts, or for conservation's potential as a pacifying force? There is need to carefully evaluate the environmental effects of past conflicts and develop the capability to rapidly assess the impact of current conflicts on the environment to try to mitigate any damage, which would help in understanding long-term health impacts of conflicts, post-conflict liability, rehabilitation, reconstruction and development strategies, and crimes and displaced and or refugees.

There is need to conduct empirical research to test the claim that environmental conservation supports cooperation and stability. How conservation and environmentally sustainable practices acts as relatively low-cost peace-building strategies? Conservation programmes can provide tangible and immediate benefits. They can neutralize a source of conflict by preventing environmental degradation and resource scarcity. If such efforts prove to contribute to peace-building, conservation will be a useful tool. Environmental scarcity is a key factor in motivating people to migrate. Environmentally displaced or refugees move from depleted rural areas to more abundant rural areas and to cities. They are sometimes compelled to cross cultural and national boundaries, where their sudden presence can trigger violence. Assessing the plight of displaced peoples is difficult, however, because there is no reliable data for

establishing baselines and trends, let alone causal sequences and impacts; this gap needs to be filled for humanitarian reasons, as well as ecological and intellectual ones. Vulnerabilities associated with environmental stress are an important area of research. What are the social and economic costs of natural hazards like floods, earthquakes, and severe weather? Besides analyzing the characteristics and costs of environmental stress, there is need to know factors causing environmental stress. There is need to address the following questions. What are the cause(s) of the vulnerability? What aspect(s) of the human system are at risk? What might be done to improve human security and thereby reduce vulnerability?

Quantitative data are essential to environment research analysis, but they often cannot tell the whole story. There is need to strengthen quantitative research analysis with qualitative information. Combining large studies and fine-grained case analysis is most likely to reveal the complex relationships among environment, conflict, and security. Social dimensions of environmental stress can only be adequately captured through case study analysis. Quantitative analysis can reveal the extent to which population and poverty are related to environment, conflict and peace. Qualitative analysis can differentiate specific cases so that each situation can be addressed based on its geo-political and historical dimensions. Quantitative and qualitative methods are not polar opposites but rather complementary forms of inquiry. Qualitative research has proven to effectively develop community buy-in for conservation measures, thereby providing a strong foundation for cooperation, and ultimately, for improving human security.

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