

Mainstreaming the environment into postwar recovery: the case for 'ecological development'

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Gorillas and guerrillas

In the past decade there has been an increased realization of the shared geography between biodiversity and conflict, with recent research finding that over 80 per cent of major armed conflicts between 1950 and 2000 occurred within biodiversity hotspots, and 90 per cent of conflicts occurred in countries containing biodiversity hotspots.¹ This finding is accompanied by an expanding body of literature detailing the effects of armed conflict and the post-conflict development process on biodiversity, leading to the observation that 'while war is bad for biodiversity, peace is often worse'.²

In response, a further body of literature has emerged analysing how the effects of conflict on biodiversity may most effectively be mitigated, and how best to encourage conservationists to engage with security and humanitarian organizations to integrate conservation into conflict and post-conflict interventions.³ This work, combined with the emergence of the environmental peacebuilding theory, has also highlighted the benefits that cooperation over environmental resource and biodiversity management can have in helping to prevent the outbreak of conflict, and enabling peacebuilding to promote a transition from armed conflict towards peace and subsequent sustainable development.⁴

In spite of this, conservationists and humanitarians still find themselves at opposite ends of a linear spectrum. In the 20 years since the original Rio summit and the emergence of the concept of sustainable development, focusing attention on the importance of the environment to humanitarian development, significant strides have been taken in integrating environmental considerations into postwar recovery, but such considerations still remain largely excluded from core security and humanitarian theory and practice. An opportunity to address an important

¹ Thor Hanson, Thomas M. Brooks, Gustavo A. B. da Fonseca, Michael Hoffmann, John F. Lamoreux, Gary Machlis, Cristina G. Mittermeier, Russell A. Mittermeier and John D. Pilgrim, 'Warfare in biodiversity hotspots', *Conservation Biology* 23: 3, 2009, pp. 578–87.

² Jeffrey A. McNeely, 'Biodiversity, war, and tropical forests', *Journal of Sustainable Forestry* 16: 3–4, 2003, pp. 1–20.

³ See e.g. the outputs of the Biodiversity Support Programme at <http://www.worldwildlife.org/bsp/aboutus.html>, accessed 20 July 2012.

⁴ See e.g. Ken Conca and Geoffrey D. Dabelko, *Environmental peacemaking* (Baltimore, MD: Johns Hopkins University Press, 2002).

issue is therefore being ignored. This article will argue that an evolutionary step beyond sustainable development is now required, both to draw together under a single banner the work on this subject carried out to date, and to encourage further practical and theoretical work to be carried out to mainstream the environment into postwar recovery. The concept of ‘ecological development’ is therefore put forward to enable this transition.

Ecological development is defined as using the management and development of environmental biodiversity to prevent the outbreak of conflict, promote peacebuilding and thereby help to end armed conflict, and enable a long-term process of post-conflict reconciliation and development that simultaneously develops biodiversity and human welfare both to meet the needs of the present generation and to improve the standard of living, sanitation and social, environmental and political stability for future generations.⁵

Two case-studies of very different conflicts, in the Democratic Republic of the Congo (DRC) and Afghanistan, are presented to elucidate the concept and demonstrate its applicability in different armed conflicts around the world. The article concludes that, at the very least, environmental resource management should become an instrument in the postwar recovery toolbox; it further argues that, given the proven importance of the environment and the peacebuilding potential of cooperation over its management, ecological development should be implemented to mainstream the environment and make it a core pillar of security and humanitarian theory and practice.⁶

In the following sections, the article first presents a close examination of the role environmental resources play in contributing to the outbreak of armed conflict, before examining the potential of environmental resource management to enable peacebuilding and post-conflict reconciliation and development. It then moves on to describe ecological development in more detail and present the two case-studies outlined above, closing with some concluding remarks.

The environment as a cause of conflict

The first area to be examined is the contributory role that environmental resources play in causing conflict, both directly at a local level and also more indirectly at a regional and international level. Many modern conflicts occur in the developing world, where the majority of the population are not only heavily dependent on natural resources for their survival, but also lack the capital, technology and

⁵ This is the current working definition for ecological development, constructed by the author. A key point to note is the phrase ‘management and development’. While sustainable development tends to focus on the sustainable extraction of existing resources, ecological development goes one step further by promoting the expansion of environmental resources to increase the quantity and quality available, and then the institution of management mechanisms to ensure their sustainable extraction: for example, planting more trees around a forest. This is discussed further in the DRC case-study below.

⁶ These conclusions derive from the author’s Master of Arts thesis in postwar recovery studies at the University of York, UK, ‘Guerrillas in the mist: are transboundary protected areas an effective tool to promote peacebuilding and development in a post conflict environment?’ (unpublished, 2011), based on primary field research carried out in the eastern DRC and western Rwanda.

knowledge required to mitigate environmental change. Environmental degradation has negative impacts on human welfare, exerting pressures on society that allow divisive identities such as ethnicity and religion to become more salient, and weakens government and community institutions, increasing the potential for the eruption of conflict.⁷ The poverty it creates decreases the opportunity cost of conflict for significant portions of the population and creates a ready pool of potential recruits for predatory rebel groups. This has local effects as well as international repercussions, allowing for the outbreak of localized armed conflict as well as the emergence of armed groups such as the Somali pirates that affect the security of the international community.

While scarcity of resources can cause conflict, an abundance of resources can also create incentives for actors to use violent behaviour to achieve their objectives and provide a revenue stream for rebel groups to fund their military campaigns. Perhaps the best example of this is the role played in Liberia's civil war by 'conflict timber', the sale of which funded Charles Taylor's military forces, and also his monetary assistance in the civil war in neighbouring Sierra Leone. While the 'blood diamonds' from this conflict are far better known, conflict timber also played a crucial, if still often overlooked, role in the continuation of the conflict.⁸

Linked with the role played by abundant environmental resources in providing funding for armed groups, and also of international relevance, are the illegal wildlife trade and associated wildlife poaching operations. While these activities have often been categorized as conservation concerns because of the threat of species extinction, they also constitute a significant security issue of international importance. Not only does the activity on the ground increase the availability of small arms and their usage, it also undermines government and wildlife authorities, forcing the diversion of resources to combat the trade, weakening institutions, and promoting corruption and complicity as government officials are bribed to forge paperwork and allow illegal goods through customs. The funds this activity provides, the weapons it brings into regions, and the weakened institutions and increasingly permeable national borders it creates, provide opportunities for organized crime syndicates, which in turn open paths into broader organized crime by providing support and ease of operation for illegal migration and arms and drug trafficking.⁹

The international effects of environmental degradation go wider still, from the loss through species extinction of potential scientific discoveries beneficial to humans to the widely publicized and grave effects of climate change. While some of the world's biodiversity and carbon sinks have remained unaffected by

⁷ James Shambaugh, Judy Oglethorpe and Rebecca Ham, with contributions from Sylvia Tognetti, *The trampled grass: mitigating the impacts of armed conflict on the environment* (Washington DC: Biodiversity Support Program, 2001), p. 11.

⁸ Murl Baker, Robert Clausen, Ramzy Kanaan, Michel N'Goma, Trifin Roule and Jamie Thomson, *Conflict timber: dimensions of the problem in Asia and Africa* (Burlington, VT: ARD Inc., 2004), pp. 137–51.

⁹ World Bank, *Going, going, gone: the illegal trade in wildlife in East and Southeast Asia* (2005), <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPENVIRONMENT/o,,contentMDK:20806207~pagePK:34004173~piPK:34003707~theSitePK:502886,00.html>, accessed 20 July 2012.

conflict, research has found that over two-thirds of biodiversity hotspots experienced armed conflict between 1950 and 2000.¹⁰ Key carbon sinks often exist in these regions: for example, the DRC contains the second largest tropical rainforest in the world.¹¹ As climate change has been identified as a ‘threat multiplier’ in international security,¹² both conflicts and poorly managed post-conflict recovery programmes that lead to deforestation have a significant impact on international security.

The connection with climate change demonstrates that a failure to conserve and protect key environmental resources can contribute to the outbreak of conflict both locally and internationally. Therefore, the security community needs to give more serious consideration to the importance of the environment, looking beyond the flora and fauna to incorporate the direct and indirect effects of environmental conditions on human welfare; and, looking beyond this again, to consider the role that environmental resource management can play in helping to bring an end to armed conflict.

Environmental peacebuilding

The potential for environmental degradation to lead to conflict means that the quality of the environment in a region can act as a tool for measuring the broader socio-economic and political situation in that region, and provide an early warning signal for when an intervention is necessary to prevent an escalation of tension into violence. This connection is illustrated by the well-known concept of the ‘tragedy of the commons’, brought about by the prioritizing of short-term self-interest over long-term development, combined with the breakdown of government and community management institutions, which can in turn lead to a downward spiral of environmental degradation, inducing a decline in human welfare and a consequent outbreak of armed conflict. A tragedy of the environmental commons can therefore also be seen to be a ‘tragedy of the social commons’.¹³

The level of environmental degradation in a given region, or more positively the effectiveness of environmental resource management, therefore acts as a barometer of the broader socio-political landscape. Currently this can only be assessed by ‘rule of thumb’ estimate; further research is warranted to discover whether and how an effective, reliable tool of measurement can be created. Such assessment also presents an opportunity: if environmental management is a measure of the broader social-political situation, then implementing effective management structures, and improving existing ones, can act as an effective conflict prevention and

¹⁰ Hanson et al., ‘Warfare in biodiversity hotspots’.

¹¹ James R. Seyler, Duncan Thomas, Nicolas Mwanza and Augustin Mpoyi, *Democratic Republic of Congo: biodiversity and tropical forestry assessment*, final report, 118/119 (Washington DC: USAID, 2010).

¹² See e.g. the EU paper ‘Climate change and international security’, S113/08, 14 March 2008, http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/reports/99387.pdf, and the UN Security Council statement SC/10332, 20 July 2011, <http://www.un.org/News/Press/docs/2011/sc10332.doc.htm>, both accessed 20 July 2012.

¹³ Jamie McCallum, vice-chairman of the IUCN WCPA transboundary specialist group, advanced this idea in an informal discussion with the author, 3 Nov. 2011.

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avoidance technique, as well as a potential means to promote a transition from conflict to peace. It is this latter potential that will now be examined in more detail.

A crucial point to note here is that while environmental degradation can contribute to the outbreak of conflict, the role it can take in peacebuilding is independent of the underlying cause of the conflict. Simply put, whether or not a conflict was brought about by environmental issues, cooperation and collaboration over environmental issues can promote peacebuilding and a transition from a period of armed conflict to one of peace and post-conflict development.¹⁴

The transborder nature of the environment and ecosystems can help to create 'eco-regions', creating a mutual dependence among parties within each region that requires cooperation and collaboration to avoid harm from environmental degradation.¹⁵ This eco-region dependence can often be acute, as in the case of countries sharing a water resource such as a river, where effective cooperation over river management to ensure a high quality and quantity of supply is essential for all those who rely on the resource for their survival.

This mutual dependence is demonstrated by research that has found that it is possible for actors to cooperate over environmental resource management even while they are engaged in armed conflict, or while intergovernmental relations are so poor that formal diplomatic dialogue is impossible.¹⁶ The shared eco-region and the mutual dependence this creates force those actors into maintaining an effective environmental dialogue and management programme in order to avoid mutually assured suffering.¹⁷

Related to biodiversity conservation, work on transboundary protected area conservation between Tanzania and Mozambique,¹⁸ and in the Virunga between the DRC, Rwanda and Uganda,¹⁹ has shown that it is possible for conservation work to be carried out between nations while intergovernmental dialogue is impossible and even where the nations concerned are engaged in active conflict. Thus environmental peacebuilding offers the opportunity to begin and maintain dialogue between opposing sides in a conflict when such contact would otherwise be impossible to establish. The conduct of this process can be bottom-up as well as top-down, depending on the circumstances of the broader conflict and political situation, and can evolve in step with changes in the political situation, continually adapting its scope and methodology to best fit into the broader political landscape.

¹⁴ Conca and Dabelko, *Environmental peacemaking*. This argument will be expanded in the sections below.

¹⁵ Alexander Carius, *Environmental cooperation as an instrument of crisis prevention and peacebuilding: conditions for success and constraints*, study commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ), (Berlin, 2006).

¹⁶ N. Mirumachi and J. A. Allan, 2007, 'Revisiting transboundary water governance: power, conflict, cooperation and the political economy', International Conference on Adaptive and Integrated Water Management, 12–15 Nov. 2007, Basel, Switzerland.

¹⁷ Carius, *Environmental cooperation as an instrument of crisis prevention and peacebuilding*. Perhaps the best real-world example is the continual river system management work carried out between Jordan and Israel, and Israel and the Palestinians, even while they were still engaged in conflict with each other.

¹⁸ Rolf D. Baldus, Rudolf Hahn, Christina Ellis and Sarah Dickinson DeLeon, 'Connecting the world's largest elephant ranges: the Selous–Niassa corridor', in Saleem Ali, ed., *Peace parks: conservation and conflict resolution* (Cambridge, MA, and London: MIT Press, 2007).

¹⁹ Milburn, 'Guerrillas in the mist'.

Because of the perceived neutrality of conservation work, organizations engaged in it are often able to continue to function and to establish and maintain a presence when other organizations cannot.²⁰ The presence on the ground helps to establish a better understanding of the situation and to improve relations and build trust between outside organizations and the local population, and provides a continuous monitoring of the situation for the outside world. This neutral presence enables a platform to be created upon which further work can build as the situation improves. The types and benefits of this work will now be discussed.

Cooperation over environmental management and working within eco-regions create ‘neutral arenas’, allowing for the dialogue discussed above, along with the opportunity to create new, shared identities among actors in a conflict.²¹ Collaborative work to manage environmental resources is strongly scientific in nature, providing a perception of objectivity, and requires a non-partisan approach, enabling all those involved to work under the shared identity of their eco-region, which thereby takes precedence over any national, ethnic or religious identities that might otherwise be the most salient in both the conflict and the post-conflict phase. This collaborative work helps to build mutual trust between those involved and sets the foundations for further collaboration to promote a transition from conflict to peace.²²

In order to maintain these benefits and prevent the resurgence of divisive identities, research has shown that peacebuilding works most effectively in these instances when the projects and issues being worked on concern a ‘dilemma of common aversions’.²³ This occurs when an issue poses a threat to all parties involved, for instance increasing desertification or declining fresh water supplies. While work to allocate a profitable resource may provoke selfish and predatory behaviour to maximize profit, as is evidenced by the continuing problems between Sudan and South Sudan over the distribution of oil, work to avoid common aversions removes the incentive for such behaviour and instead necessitates collaboration as the only means to prevent the suffering that threatens everyone involved. This collaboration builds mutual trust between all parties, promoting and enabling peacebuilding.

The neutral arena of the eco-region creates another useful tool to help overcome issues of sovereignty. The neutrality of an eco-region and the necessarily shared area that it occupies offers the possibility of creating a ‘grey area’ with regard to sovereignty, which is perhaps most effectively brought out by the emergence of transboundary protected ‘peace parks’: conservation areas that cross national boundaries and fall under the aegis of a joint management institution

²⁰ Rosalind Aveling, Helena Anthem and Annette Lanjouw, ‘A fighting chance: can conservation create a platform for peace within cycles of human conflict?’, in Nigel Leader-Williams, William M. Adams and Robert J. Smith, eds, *Trade-offs in conservation: deciding what to save* (Oxford: Wiley-Blackwell, 2010).

²¹ Ken Conca and Jennifer Wallace, ‘Environment and peacebuilding in war-torn societies: lessons from the UN Environment Programme’s experience with post-conflict assessment’, *Global Governance* 15: 4, 2009, pp. 485–504.

²² Randy Tanner, Wayne Freimund, Brace Hayden and Bill Dolan, ‘The Waterton-Glacier International Peace Park: conservation amid border security’, in Ali, ed., *Peace parks*, pp. 183–99.

²³ Ali, ed., *Peace parks*, p. 335.

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drawn from all countries involved.²⁴ With a peace park, all countries have a claim to the regions within the protected area, and yet none has an exclusive claim as the park stands independently of their national boundaries. Since there have been, and remain, a huge number of conflicts, both violent and passive, concerning sovereignty, this offers a potential solution to at least some of those problems. Perhaps the best example is the proposal for a Siachen peace park between India and Pakistan. Because of the blood that has been spilt and the passions evoked by the long-standing conflict between these two countries, neither is willing to cede any territory. By establishing a peace park in the area, both countries could assure their electorates that they had not sold out their interests. The creation of a peace park could therefore form part of a process of conflict de-escalation, while also bringing huge benefits to the populations of the countries in money and lives saved as well as helping to end the degradation of the Himalayan environment in this area.²⁵

While much of the above analysis has focused on international work, the underlying principles are also applicable at the local or community level. Problems that could lead to an outbreak of conflict between communities, such as livestock overgrazing or deforestation, can be managed through the development of community-level environmental institutions, encouraging dialogue to prevent an escalation into armed conflict, thus averting the dual tragedies of the commons discussed above.²⁶

Linking the two strands of the topic outlined above is the role environmental management can play in promoting socio-economic development, improving livelihoods to prevent an outbreak of conflict and foster an effective and durable post-conflict reconstruction and development process. The promotion of socio-economic development takes place along two core paths: through improved ecosystem services that allow for better livelihoods and consequent socio-economic development, and through generating income in the form of payment for ecosystem services (PES) schemes and tourism.

While the latter is often put forward as an argument for conservation and its ability to generate income, it is perhaps not the most crucial. The sensitivity of tourism to local or regional insecurity and fluctuations in the world economy makes it an unreliable source of income for regions in, or emerging from, armed conflict. Similarly, establishing PES schemes in unstable regions remains fraught with difficulty.²⁷ While both processes can provide income and an associated incentive for governments to invest in maintaining security, a more resilient and far-reaching process is required.²⁸

The improved ecosystem services gained from effective environmental management are a far more useful and far-reaching benefit. The dependence of much of

²⁴ Ali, ed., *Peace parks*.

²⁵ Kent L. Biringer and Air Marshal (ret.) K. C. Cariappa, 'The Siachen Peace Park proposal: reconfiguring the Kashmir conflict?', in Ali, ed., *Peace parks*, pp. 277–90.

²⁶ This point is discussed further in the case-studies below.

²⁷ The REDD+ scheme, which offers a promising approach to overcoming these issues, is discussed in the DRC case-study below.

²⁸ See Milburn, 'Guerrillas in the mist'.

the population within regions of armed conflict on ecosystem services, both for their livelihoods and for their health, means that improving the quality and accessibility of such services will have the greatest effect on the largest number of people. Improving the quality of the local environment and water systems enhances the outputs of farmers, fishermen and other such workers, as well as improving the sanitation of the population through access to clean water, improved nutrition and the effective disposal of sewage. Improving the quality of the local environment also helps protect against environmental disaster such as landslides or drought, ensuring a sustainable and resilient post-conflict recovery process.

By combining this development process with the creation of environmental management institutions, from community level up to international level, an effective conflict mitigation and resolution process, leading to a process of long-term recovery, can be instituted. This creates arenas for dialogue to build trust and new shared identities, improves socio-economic development—in so doing increasing the opportunity cost of conflict—entrenches the rule of law, enhances medical welfare and sanitation, strengthens the capacity of the state, and helps to overcome tensions that could otherwise trigger a return to conflict. Environmental management can therefore play a central role in conflict mitigation, promoting a transition from conflict to peace, and a healthy, prosperous and durable post-conflict reconstruction and development process.

Moving beyond sustainable development

The shared geography of armed conflict and biodiversity and the importance of both in influencing human survival and prosperity provide an almost universal scope for environmental cooperation to help to prevent the outbreak of, and bring an end to, armed conflict. Given the success of the environmental peacebuilding and development work carried out to date, as well as the potential for further such work to be implemented, environmental management offers a crucial opportunity for an effective new approach to conflict and humanitarian development.

The year 2012 marks the 20th anniversary of the Rio ‘Earth Summit’ and the emergence of the concept of sustainable development. The summit helped to encourage greater consideration of the environment, and subsequently a diverse range of efforts were made to increase the salience of the environment among those involved with security and humanitarian development.²⁹

While these movements have helped to elevate consideration of the environment to a more prominent position, it remains largely excluded from core security and humanitarian work. A new term and concept is therefore required to unite these somewhat disparate efforts, to promote an improved appreciation of the value of the environment, and to mobilize far greater interest and resources to mainstream the environment into security and humanitarian debate and practical

²⁹ For example, the inclusion of an environmental component within the UN’s Human Security Framework and the development of the ‘environmental peacemaking’ theory and ongoing work in this area at the Woodrow Wilson Center, Washington DC.

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action. Therefore, 20 years on from the establishment of sustainable development, an evolutionary step forward is required—and this can be taken through the definition of a new concept, ‘ecological development’.

Ecological development is defined as using the management and development of environmental biodiversity to prevent the outbreak of conflict, promote peace-building and thereby help to end armed conflict, and enable a long-term process of post-conflict reconciliation and development that simultaneously protects biodiversity and human welfare both to meet the needs of the present generation and to improve the standard of living, sanitation and social, environmental and political stability for future generations. While this concept is as yet in its infancy,³⁰ the mere presence of a new term is an important step forward. Much as the promulgation of the term ‘sustainable development’ paved the way for the emergence of the environment as a prominent consideration in national and international policy discourse by providing a widely utilized framework which necessitated reducing environmental degradation to enable successful long-term humanitarian development, now ‘ecological development’ paves the way for the promotion of the environment not merely as a consideration, but as a core pillar of security and humanitarian theory and practice.

Ecological development is therefore designed as both a theoretical and a practical framework to encourage and enable greater consideration and application of environmental management in regions of armed conflict. The aim is to encourage a far greater body of research into both the utility of environmental management and its limitations, to establish a firm and well-evidenced theoretical framework for the application of the new concept. Crucially, this work must be conducted from a humanitarian and security-focused perspective, rather than a conservation-orientated one, as is currently often the case. Furthermore, ecological development aims to encourage far greater integration of the environment into practical conflict and humanitarian intervention: for example, expanding the use of a conservation logic in humanitarian development projects,³¹ and also into world health projects, using environmental management to improve water quality and sewage disposal and thereby sanitation.

Commencing such work and thereby altering attitudes towards the environment and elevating its importance will bring benefits for both conservation and humanitarian development. Rather than environmental degradation being seen as a regrettable but necessary result of trying to meet short-term humanitarian needs, it will instead be seen as an indicator of the need for effective intervention, and environmental management will be seen as the tool by which to make that intervention. Furthermore, it can act as an effective resource-mobilizing tool by framing usually unfashionable projects in more eye-catching terms to attract funding: for example, a sewage treatment project could be presented as a wild bird protection and wetland habitat construction programme in order to attract

³⁰ It is currently under development at the Marjan Centre for the Study of Conservation and Conflict within King’s College London’s Department of War Studies: see <http://www.kcl.ac.uk/sspp/departments/warstudies/research/groups/marjan/index.aspx>, accessed 20 July 2012.

³¹ The term ‘conservation logic’ is explained in the DRC case-study below.

greater attention and finance from a more diverse range of funding organizations and interest groups.

To demonstrate more explicitly how ecological development would function, two case-studies of very different conflicts will be presented here. The first, in the DRC, has been generally overlooked and received a significantly underresourced response, while the second, in Afghanistan, has received a lot of attention and significant active international involvement. Examining these two cases will help to draw out the underlying principles of ecological development and consequently demonstrate its applicability to armed conflict around the world.

Healing the Great Albertine Rift

This first case-study will focus on the DRC and two of its neighbours, Uganda and, more importantly for the purposes of this article, Rwanda. This region has been chosen because of the combination of its high level of biodiversity—including world-renowned species such as the bonobo and the mountain gorilla, and the second largest tropical rainforest in the world—and the variety and intensity of armed conflict it has experienced, with a history of both interstate and intrastate, as well as active and latent, conflicts that continue to this day. While the 1994 genocide in Rwanda captured the world's attention, the death of 10 million people in the DRC since 2002 and the myriad continuing forms of violence have yet to arouse support for an effective intervention. It is therefore of crucial importance to find ways to mobilize interest and resources, combined with an effective and plausible methodology for bringing an end to the conflict and promoting a successful post-conflict development phase. Here I propose ecological development as the basis for such an intervention, first setting out similar work that has been conducted to date, then suggesting what further work could, and should, be carried out in the region.

While significant conservation efforts have been conducted in different regions of these three countries, the most successful and far-reaching process is the work carried out to conserve the mountain gorilla in the Virunga region, sitting on the borders of northern Kivu in the DRC, western Rwanda and western Uganda. Just as the conflict in this region crosses borders, so also does the biodiversity. The work carried out to conserve the 800 or so gorillas living in the region since the early 1990s has had effects not only in terms of conservation, but also in more wide-ranging humanitarian terms, promoting peacebuilding to improve relations between countries previously fighting on opposite sides of 'Africa's world war', and fostering socio-economic development for the countries involved and the communities living around the protected areas. As such, this region offers an ideal test case of how biodiversity management can work to promote an end to conflict and the establishment of long-term post-conflict recovery.

The process in Virunga is an example of the ability of environmental management to establish dialogue between opposing sides. When the project was started, intergovernmental relations were so poor that dialogue at that level was

impossible. Instead, a bottom-up approach was implemented, following what has been described as an ‘NGO–state model’.³² Crucially, it is a conservation NGO—the International Gorilla Conservation Programme (IGCP)—rather than a humanitarian or peace NGO, that has driven this process. By enabling and improving cooperation between the three nations’ respective wildlife agencies, and establishing conservation-friendly income generation projects, the project has effectively conserved the gorillas while simultaneously promoting peace and socio-economic development in the region. This dual process of conservation and humanitarian development has been most evident in Rwanda. At the national level, tourism, based primarily on the mountain gorillas, has become Rwanda’s largest source of foreign exchange. At a local level, community-based livelihood programmes have been implemented, addressing the poverty that makes people dependent on protected area resources, and doing so with a ‘conservation logic’: that is, making receipt of the rewards of these programmes contingent upon successful conservation-orientated behaviour by project beneficiaries.³³

Since the beginning of the century several proposals have been made to settle parts of Volcanoes National Park, Rwanda’s portion of the Virunga gorilla habitat; however, the presentation by conservation organizations of the value of gorilla tourism was a strong enough argument to preserve the park.³⁴ This has drawn attention to the value and importance of conservation efforts, which are now being actively expanded, for instance in the nearby Gishwati forest. Refugees from the DRC were resettled around this forest after the genocide, and over time the resulting pressures on the environment led to the almost total deforestation of Gishwati, providing an example of the dual tragedies of the commons argument made earlier. The Great Ape Trust, mobilized by the presence of a group of chimpanzees still living in the forest, is now working on the preservation and rejuvenation of the area and the surrounding communities, for the benefit of the people and chimpanzees alike.³⁵

The environmentally orientated approach taken in the Virunga and Gishwati has brought significant benefit to Rwanda, and helped to halt the decline in human welfare brought about by environmental degradation. It has also helped to improve relations between the national governments of Rwanda and the DRC, evident for example in the change from hostility over Rwandan army cross-border incursions into the DRC to active cooperation over joint military incursions. While the gorilla conservation was not the sole cause of this, cross-border cooperation between wildlife agencies did help to build trust and provided evidence of the

³² Adrian Martin, Eugene Rutagarama, Marke Gray, Anecto Kayitare and Vasudha Chhotray, *Transboundary natural resource management in the greater Virunga* (Enterprise, Environment and Equity in the Virunga Landscape of the Great Lakes, 2009), <http://www.virunga.net/wp-content/uploads/downloads/2010/11/LL-Transboundary-Natural-Resource-Management.pdf>, accessed 20 July 2012.

³³ Adrian Martin, Eugene Rutagarama, Marke Gray, Stephen Asuma, Mediatrice Bana, Augustin Basabose and Mark Mwine, ‘Linking development interventions to conservation: perspectives from partners in the International Gorilla Conservation Programme’, *Society and Natural Resources* 24: 6, 2011, pp. 626–36.

³⁴ Annette Lanjouw, ‘Building partnerships in the face of political and armed crisis’, *Journal of Sustainable Forestry* 16: 3–4, 2003, pp. 89–110.

³⁵ From research carried out for Milburn, ‘Guerrillas in the mist’; see also Great Ape Trust, <http://www.greatapetrust.org/forest-of-hope/>, accessed 20 July 2012.

potential success of such operations, encouraging their adoption and extension. This in turn indicates a need for closer examination of the benefits that an ecological development approach could bring to the DRC.

The conflict in the DRC is currently significantly overlooked and the response underresourced, because the complexity of the conflict and the degree of violence involved make comprehension of its causes and formulation of an effective intervention strategy very difficult.³⁶ Ecological development could help to overcome both of these factors.

First, through an approach that focuses simultaneously on biodiversity conservation and community development, greater public interest can be garnered to support intervention, using the ‘fuzzy’ or ‘green’ fundraising approach associated with high-profile animals and the fight against climate change. An example of this process is provided by the work being done to preserve the Congo’s carbon sinks through the establishment of the DRC as a trial country for the REDD+ scheme, which aims to lower carbon emissions by reducing deforestation and forest degradation in the developing world.³⁷ This is an example of the ‘management and development’ component of ecological development as defined above: REDD+ does not just conserve current forest stocks, but works to expand them through reforestation programmes. Thus it contributes both to the fight against climate change and to the promotion of socio-economic development by increasing the quality and quantity of environmental resources available to people in the DRC. It has also helped to increase the capacity of the state from the bottom up, using regional government bodies to implement REDD+ projects, in so doing improving governance and strengthening the rule of law, for instance through improved land rights and application of the Forestry Code.

Though the current process has been driven from abroad to a significant degree, its success suggests the need for the establishment and support of indigenous processes. Such a process is already under way around Kahuzi-Biega National Park. Here the Pole Pole Foundation has engaged local communities to plant over one and a half million trees around the park. This has improved the conservation of the park and the gorillas living within it, as well as the livelihoods of the people living nearby: those who planted the trees have gained ownership of them, allowing them to be cut down and sold, for instance as charcoal.³⁸ Supporting such community-led efforts is of critical importance, and would help to mitigate potential fluctuations in the price of carbon or the money provided for reducing carbon that could have a negative impact on REDD+ schemes. Again, demonstrating the humanitarian development benefits of schemes like REDD+ is crucial to ensuring their widespread and sustained implementation.

Building on the processes outlined above, ecological development offers a framework of intervention focused on a regional, community-driven approach,

³⁶ Jason K. Stearns, *Dancing in the glory of monsters* (New York: PublicAffairs, 2011).

³⁷ See ‘Inventing REDD+’, document produced by DRC, http://www.cd.undp.org/mediafile/REDD+_brochure_Inventer_anglais.pdf, and the UN-REDD programme website, <http://www.un-redd.org/AboutREDD/tabid/582/Default.aspx>, both accessed 20 July 2012.

³⁸ Author’s field research; see also <http://www.polepolefoundation.org>, accessed 20 July 2012.

rather than addressing the conflict in the DRC as a single entity. Breaking the country down into smaller subregions and addressing the problems in those regions through community-driven projects with a strong conservation logic would deliver measurable results in improving security, humanitarian development and biodiversity conservation. Furthermore, by establishing community institutions, it could help to repair the social fabric of broken societies within the country.

Following a framework of regional, bottom-up intervention would also aid in state-building. Currently the Congolese state is ineffective at best. The sheer size of the country and its poor transport network, its fragile government in Kinshasa, its shortage of revenue and the corruption of the governing elite all limit the effectiveness and reach of the state. One government agency that does operate in many regions of the country and could operate in more regions if ecological development were implemented is the Congolese wildlife authority (*Institut Congolais pour la Conservation de la Nature, ICCN*). If the ecological development approach was adopted in the DRC, ICCN would become the government institution managing environmental resources throughout the country, engaging with local communities to promote conservation and humanitarian development. Using ICCN as the main governmental institution to implement environmental resource management would not only help to build its own capacity, but would also provide more Congolese citizens with a familiarizing—and, crucially, positive—exposure to the institutions of the state. Building the capacity of ICCN and its interaction with local communities would help to strengthen the state from the bottom up, increasing and strengthening its effectiveness, capacity and reach, and engaging more citizens in its work. Through this process, ICCN would act as an ‘incubator of the state’, entrenching the regional approach required for effective governance in the country and using environmental management as a platform on which to carry out further state-building work.

While this approach would have some effect, it would be constrained by the continued presence of rebel groups in the country. Ecological development offers a solution to this problem as well, through the creation of the ‘Yellow Berets’.³⁹ This berets concept builds on Mikhail Gorbachev’s idea of creating ‘Green Helmets’, UN peacekeeping soldiers who would take off their blue helmets and put on green helmets to act under a specific environmental protection mandate. The Yellow Berets idea goes a step further: rather than getting UN peacekeepers to protect the environment, it engages rebel soldiers to do so instead. The idea of directly engaging rebel soldiers is born out of two key principles. First, the limited mandate and resources of UN peacekeepers make it virtually impossible for them to take on an effective environmental protection role. Second, it diverts the soldiers from armed conflict by engaging the ‘enemy’ with ‘dollars rather than bullets’, offering the opportunity of a gradual disarmament, demobilization and reintegration (DDR) programme and a host of alternative livelihood schemes based on environmental resource management.

³⁹ Yellow is chosen as the colour to distinguish the concept from both the green helmets and the current blue berets of UN peacekeeping troops, but maintain a ‘soft’ colour, in keeping with the blue of UN peacekeepers.

The Yellow Berets would, then, be a DDR programme, but with several differences from conventional programmes. First, rebel soldiers and groups would be brought under neutral international control, exercised by either the African Union or the United Nations. Bringing the rebels under this neutral control would avoid the problems associated with integrating rebel groups into the national army, as illustrated by the recent defection of troops loyal to Bosco Ntaganda.⁴⁰ Instead, command would be taken over by senior officers from the UN military,⁴¹ and the soldiers would be trained, administered and paid by the UN. They would take on several roles, all related to environmental resource management. Some would remain armed, but with a new mandate to ensure environmental protection and avoid the dangers of post-conflict environmental degradation through uncontrolled natural resource extraction. Other soldiers would be placed in schemes for alternative livelihood and infrastructure construction, all working under the auspices of the Yellow Berets, with military courts running under UN auspices to bring to justice soldiers who engaged in acts of violence. The combination of environmental protection and the promotion of socio-economic development would help to assert the rule of law, bring peace and security, and establish development according to a strong conservation logic, as well as promoting reconciliation and improved relations between rebel soldiers and communities.

The use of ICCN as incubator of the state and the formation of the Yellow Berets as a new form of DDR are just two among a range of projects and techniques that could be implemented in the process of ecological development in the DRC, but they illustrate some of the benefits of this approach. Though it would not solve every problem, it would provide a framework for an effective intervention and establish a base level of security and development, creating a platform for the longer-term process of rebuilding the whole of the society and state. In doing so it would preserve and expand the stock of biodiversity and associated ecosystem services for the DRC, neighbouring countries and the whole world. By bringing stability to the region and engaging the Yellow Berets in controlled natural resource extraction and infrastructure development, it would also help to secure the supply of some of the region's valuable resources such as coltan, once more benefiting both the DRC and the international community. Ecological development provides an effective means to intervene and help to bring peace and development to one of the worst-afflicted regions of the modern world, and in so doing develop the techniques and frameworks required for interventions in other regions.

⁴⁰ 'Bosco Ntaganda: Congo's "Terminator" troops defect', BBC News, 5 April 2012, <http://www.bbc.co.uk/news/world-africa-17629500>, accessed 2 April 2012.

⁴¹ The UN is chosen here simply because of its current presence in MONUSCO, and therefore the increased ease with which it could take over a yellow-beret command role.

Expanding Afghanistan's Green Zone

Three decades of conflict have wrought significant damage upon the environment of Afghanistan and in turn upon the Afghan people, who depend on the environment for their survival. Up to 80 per cent of Afghans depend directly on natural resources, and agriculture provides livelihoods for over 60 per cent of the population. The long-term degradation of the environment has led to increased desertification and deforestation, including the loss of huge areas of pistachio trees in the Badghis and Takhar provinces of northern Afghanistan that used to provide a significant source of income.⁴²

Afghanistan is dependent upon the Hindu Kush mountains for most of its water supplies, brought to the lower regions of the country through rivers. The supply is intermittent, and has declined in the past years because of drought and rising air temperatures. The issue of water scarcity is worsened by poor sanitation and waste management, which contaminates aquifers and threatens further contamination of rivers should heavy rainfall or flash floods wash urban waste into rivers. The combination of intermittent water supply and water contamination has led to over two and a half million Afghans being affected by drought and water shortages. In another example of the dual tragedies of the commons, the environmental destruction in Afghanistan has come about because of the collapse of institutions and the subsequent decline in the rule of law and environmental management capacity of communities and the state, leading to unsustainable extraction and depletion of the Afghan environment.

Addressing environmental issues is therefore critical to enabling effective national recovery and future prosperity, and so significant work has been carried out, driven primarily by the United Nations Environment Programme (UNEP). UNEP's involvement began with the research and publication of a post-conflict environmental assessment in 2003. This report documented the state of the Afghan environment as well as setting out the key issues that needed to be addressed, and recommendations on how to do so. From this base, work was carried out both directly through UNEP and also through the Afghanistan government, with the formation of the National Environmental Protection Agency (NEPA) to build the capacity of the state to manage the environment, codify its management into law through the Environment Law, and implement projects to regenerate the environment and promote sustainable humanitarian development. UNEP's work and the establishment of NEPA has led to the creation of the Afghanistan Conservation Corps (ACC) and the launch of a host of trial projects, with the prospect of further scaling up and implementation across the country.⁴³

⁴² For this case-study, see UNEP, *UNEP in Afghanistan: laying the foundations for sustainable development* (2009), http://www.unep.org/pdf/UNEP_in_Afghanistan.pdf; UNEP, *The UNEP programme in Afghanistan: annual report* (2010), http://www.unep.org/dnc/portals/155/dnc/docs/afg/Afgh_AR10_web.pdf; UNEP, *Afghanistan's environmental recovery: a post-conflict plan for people and their natural resources* (2007), http://postconflict.unep.ch/publications/UNEP_afghanistan_lr.pdf, all accessed 20 July 2012.

⁴³ From UNOPS website, <http://www.unops.org/english/whatwedo/unopsinaction/pages/afghanconservationcorps.aspx>, accessed 20 July 2012.

These trial schemes have included an increasing number of community based natural resource management (CBNRM) projects, designed both to develop environmental resources and community institutions to manage them sustainably, and also to help in conflict resolution and prevention: an example is the ‘Peace on Pastures’ scheme set up in the central highlands, which has achieved considerable success. Simultaneously, work has been carried out to improve biodiversity conservation, leading to the establishment of Afghanistan’s first national park, Band-e-Amir. The work carried out to establish this park, led by the Wildlife Conservation Society (WCS), has helped protect key biodiversity and pristine lakes, as well as providing the potential for a future tourist industry in the region.⁴⁴

While the work carried out by UNEP and the WCS has achieved success and helped to raise awareness of and the importance accorded to the environment in Afghanistan, the environment remains on the outskirts of core humanitarian and conflict work in the country. If an ecological development approach were adopted, humanitarian and military organizations would be engaged to carry out the environmental post-conflict recovery work that is required.

Building on work already undertaken to improve the water supply and general quality of the Afghan environment, and to establish Band-e-Amir national park, ecological development would engage national and international humanitarian NGOs, along with military and government agencies, in developing environmentally based humanitarian development programmes. Using the conservation logic outlined above, reforestation programmes would be implemented along with further CBNRM programmes, focusing on promoting socio-economic development and creating arenas for dialogue to resolve conflicts and encouraging mutual trust between those involved. These processes would also be designed to have broader effects.

One issue that has emerged in Afghanistan is people’s lack of exposure to and familiarity with the state and its institutions. To address this lack, and offer an effective bottom-up process of post-conflict development, a programme of community-based recovery (CBR) has been implemented.⁴⁵ In a fashion similar to the process outlined in the DRC case-study above, ecological development would engage NEPA and the ACC to implement many of these programmes, providing people with a positive exposure to the state and rebuilding the capacity of the central government. While CBNRM initiatives would form part of this process, so too would an increased effort to establish more national parks around the country.

This community-level development process would help to develop the state from the bottom up and secure and develop key ecosystem services, as well as encouraging the creation and expansion of a tourist industry and the associated extra income and incentives for improving and maintaining security this would bring. The development of these ecosystem services and the tourist industry would in turn create the space for the establishment of a Yellow Berets programme in

⁴⁴ See <http://www.wcs.org/where-we-work/asia/afghanistan.aspx>, accessed 20 July 2012.

⁴⁵ From a presentation delivered by David Connolly, University of York, at the seminar ‘Digging the dirt with the Yellow Berets’, King’s College London, 20 March 2012.

regions within Afghanistan, similar to that suggested for the DRC in the previous case-study. Finally, it would help to change and improve the image of Afghanistan, moving away from one of conflict towards one of natural beauty, helping the country regain worldwide respectability and providing a source of Afghan pride, national identity and unity.

Much of the work to develop ecosystem services through CBNRM programmes and the establishment of national parks, as well as the process of developing the state from the bottom up through the use of CBR, is being carried out already. What ecological development aims to do is to unite these elements more effectively into a more wide-reaching process, directly engaging humanitarian and military organizations in environmental management, regeneration and development projects to secure and improve the quality of the Afghan environment and the quality and supply of water, and thereby the welfare of the Afghan people. Ignoring the environment will expose Afghanistan to the constant threat of catastrophe, limiting the effectiveness and resilience of any intervention work. Implementing ecological development will turn this threat into an opportunity, producing an effective and durable post-conflict reconstruction and development process.

Conclusion

The different sections of this article have shown both the role that environmental resources can play in contributing to armed conflict, from local to international level, and the role that their management and development can have in ending conflicts and promoting durable and successful post-conflict recovery. The shared geography between the world's biodiversity and regions of armed conflict creates both a key challenge and a key opportunity for those involved in the security and humanitarian development sectors. While an ever-expanding body of work has raised the profile of the environment in these fields, those efforts have remained somewhat disparate, and have yet to penetrate into core theory and practice.

In the year of the 20th anniversary of the Rio summit and the establishment of sustainable development, an opportunity is afforded for taking the necessary evolutionary step beyond sustainable development towards the concept of 'ecological development'. Ecological development is designed as a theoretical and practical framework to unite under a common umbrella the work carried out to date, and to encourage a far greater appreciation and study of the importance and utility of environmental resource management and development among those involved in the fields of security and humanitarian development. If the environment is made a core pillar of conflict and humanitarian study and practical work, the evolution of ideas and establishment of mechanisms and frameworks will help to bring a greater quantity and quality of peace, security and development in all regions of the world.

Therefore, at the very least, environmental management should become an instrument in the postwar recovery toolbox, used as a measuring tool for pre-

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emptive intervention and to create a platform for further work during armed conflict, as well as a neutral arena to enable otherwise impossible dialogue between opponents, and finally as a post-conflict reconciliation and development tool to help create durable and peaceful resolutions to conflict. While this instrumental role should be the baseline, a more effective and widespread process should be initiated to develop the proposal for ecological development into a coherent and codified framework, moving beyond sustainable development and promoting a more durable and effective methodology for postwar recovery in the twenty-first century.