The roots to peace in the Democratic Republic of Congo: conservation as a platform for green development

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The Democratic Republic of Congo (DRC) is endowed with a wealth of natural resources, and the presence of high-value minerals such as coltan and diamonds is well known. The country is also endowed with a wealth of biodiversity, although the value of this is often overlooked. The DRC ranks fifth in terms of the most biodiverse countries in the world; it is home to a plethora of endemic species of both flora and fauna and contains the second largest rainforest in the world, smaller only than the Amazon.[1] This range of flora and fauna has suffered enormously from the effects of armed conflict in the country over the past two decades, and many wildlife populations have been decimated. In spite of destruction through conflict, key populations and ecosystems still remain and they are crucial for the country's development and the world's fight against climate change.

The DRC's conflict is complex and poorly understood. It has exacted an enormous toll of human suffering in the country, where over five million people have died.[2] It is therefore of the utmost importance to identify contributory factors to the conflict and methods to help end it; and to find ways to promote development to lift the people out of poverty and enable them to move to sustainable economic growth. This article examines the role biodiversity can play in this process.

The combination of a wealth of biodiversity, the poverty of the majority of the population,[3] and almost two decades of inter- and intrastate armed conflict (which continues to this day) make the country an excellent case-study through which to examine the interaction of biodiversity, armed conflict and development. The author's experience working with gorilla conservation organizations in the eastern part of the country has provided an insight into the damage caused by conflict to this valuable biodiversity and the continuing threats of further damage, as well as the methods being employed to protect biodiversity and to help communities develop. This experience is combined with ongoing research that draws on evidence from other regions in the DRC and around the world to evaluate not only how valuable biodiversity is, but also how that value can most effectively be realized.

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

[2] Jason Stearns, *Dancing in the glory of monsters: the collapse of the Congo and the great war of Africa* (New York: PublicAffairs, 2011).

[3] The DRC is ranked 186 out of 187 in the 2013 Human Development Index: see http://hdr.undp.org/sites/default/files/Country-Profiles/COD.pdf, accessed 24 May 2014.

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The analysis contained in this article describes the impact of armed conflict on biodiversity in the DRC and finds that it is overwhelmingly negative, with the sole exception of low deforestation rates attributable to the persistent insecurity that has served to limit timber exploitation and which has acted as an effective means of protection. The possibility of peace returning to the DRC, however, brings with it significant threats of environmental degradation, which in turn could undermine the ability of the country and its people to recover from conflict. The article outlines the threats of biodiversity loss to both the DRC and the international community—the danger of lost key carbon sinks thus contributing to increased climate change—to demonstrate the importance of biodiversity as a security concern. It then proceeds to outline the methods currently being used to protect biodiversity and to effectively realize its value in terms of both ecosystem services and monetary income. From this, the article draws broader conclusions about the importance of biodiversity conservation for improving security and promoting development, arguing that the false dichotomy of conservation and development as separate entities and objectives needs to change, with conservation becoming a central pillar of security and development work. In this respect, it may be argued, the example of the DRC holds lessons for other regions around the world affected by current or recent armed conflict.

Conflict and conservation in the DRC

The large number of armed conflicts in the DRC over the past two decades have significantly harmed biodiversity in the country, leading to the decimation of populations of many large mammals and the loss of vast swaths of forests in protected areas. At the same time, the illegal trade in wildlife, timber and charcoal has provided funding for rebel militias and opportunities for insecurity. However, conflict has not been wholly negative for the environment, particularly with regard to forestry, where national deforestation rates are at a low level, especially in comparison to neighbouring countries. Precise information on the impact of conflict on biodiversity in the DRC is difficult to obtain, owing to the problems of gathering data in such a vast and conflict-afflicted country.[4] Nevertheless, broad trends and estimates of the impacts on wildlife populations have been identified, and the results are presented below alongside an examination of how control of the illegal wildlife, charcoal and timber trades has provided funding to help sustain the conflict.

Virunga National Park in North Kivu province in eastern DRC suffered from an influx of refugees in the aftermath of the 1994 Rwandan genocide when refugee camps were set up close to, or in some cases within, park boundaries. The influx of people led to large-scale deforestation in Virunga National Park as refugees gathered dead wood and, when that was exhausted, started

[4] Jurgen Brauer, *War and nature: the environmental consequences of war in a globalized world* (Lanham, MD: AltaMira Press, 2009), pp. 119–21.

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to fell trees to provide fuel.[5] The 1996 invasion of the DRC by Rwandan- and Ugandan-backed rebels provided some respite for the park when refugees fled westwards through the country. But the park has continued to suffer the impacts of refugee camp populations since then, as well as continuing threats from illegal logging, charcoal-burning and agriculture. In spite of these depredations, the population of mountain gorillas has increased over the past two decades, although largely due to growth in the numbers of gorillas living in the Ugandan and Rwandan sections of the Virungas.[6] Nonetheless, gorillas have been killed in the DRC in retaliation for the efforts by rangers from the Congolese wildlife service, the Institut Congolais pour la Conservation de la Nature (ICCN), to reduce the charcoal trade and the associated deforestation in Virunga National Park.[7]

The charcoal trade is a valuable source of income as charcoal accounts for 85 per cent of domestic energy use in the DRC.[8] The Democratic Forces for the Liberation of Rwanda (FDLR), a rebel group based in North and South Kivu provinces made up of members with links to those who perpetrated the Rwandan genocide, have exploited this opportunity to provide themselves with the funds they need to maintain their presence in the Kivus,[9] and it is estimated that they earn in the region of US$28 million per year from the trade.[10] The Armed Forces of the Democratic Republic of the Congo (FARDC) also seem to be involved in the charcoal trade, using the presence of the FDLR and its involvement in the trade as a veil under which it too can venture into the Virunga National Park to fell trees for charcoal.[11]

While the flight of refugees reduced pressure on Virunga National Park, it created severe problems for Kahuzi-Biega National Park (KBNP) in South Kivu province, as refugees fled directly through the park, killing large numbers of wildlife in the process: censuses record the loss of over half the eastern lowland gorilla population and more than 95 per cent of the population of elephants.[12] The presence of valuable minerals in KBNP has added to the environmental harm it has suffered because the mining of these minerals is accompanied by poaching for bushmeat and the felling of trees to provide fuel and food for local communities.[13]

[5] Brauer, *War and nature,* pp. 130–32.

[6] The Virungas refers to four protected areas in the Virunga Volcanoes region which the gorillas inhabit: Virunga National Park in the DRC, Volcanoes National Park in Rwanda, and Mgahinga National Park and Bwindi Impenetrable Forest in Uganda.

[7] Christian Nellemann, Ian Redmond and Johannes Refisch, eds, *The last stand of the gorilla: environmental crime and conflict in the Congo Basin* (Nairobi: United Nations Environment Programme, 2010), p. 6, http://www.unep.org/pdf/GorillaStand_screen.pdf, accessed 24 May 2014.

[8] Seyler et al., *Democratic Republic of Congo*, p. 69.

[9] IRIN, 'DRC: charcoal profits fuel war in east', 28 July 2009, http://www.irinnews.org/Report.aspx?ReportId=85462, accessed 24 May 2014.

[10] Nellemann et al., *The last stand of the gorilla*, p. 26.

[11] Stefan Lovgren, 'Congo gorilla killings fueled by illegal charcoal trade', *National Geographic News*, 16 Aug. 2007, http://news.nationalgeographic.com/news/2007/08/070816-gorillas-congo.html, accessed 24 May 2014.

[12] Juichi Yamagiwa, 'Bushmeat poaching and the conservation crisis in Kahuzi-Biega National Park, Democratic Republic of the Congo', *Journal of Sustainable Forestry* 16: 3–4, 2003, pp. 111–30.

[13] Nellemann et al., *The last stand of the gorilla*, p. 6.

Other protected areas and wildlife populations have also suffered from the conflicts. For example, the Okapi Faunal Reserve endured degradation and loss of wildlife as a result of rebel forces moving into the area and hunting for bushmeat and ivory; even after the ICCN regained control of the reserve, there was increased poaching by the FARDC in 2009,[14] and Salonga National Park, the largest park in Central Africa, has only 1,000–2,000 elephants remaining.[15] Throughout the DRC as a whole, elephant populations are estimated to have fallen from over 100,000 fifty years ago to fewer than 20,000 today, and numbers continue to decline.[16]

The loss of elephants has also contributed to conflict in the country, as ivory has been sold to fund rebel organizations. This process has been highlighted by the release of the Enough Project's report on the use by the Lord's Resistance Army (LRA) of ivory from elephants in Garamba National Park, in Orientale province in north-eastern DRC, to provide funding after many other avenues were cut off.[17] Evidence has also emerged that it is not only the LRA that is engaged in the ivory trade in Garamba; the Ugandan Army is also suspected of involvement,[18] and some attacks on elephants that have been attributed to the LRA were in fact carried out by the FARDC, using the cover of the LRA's presence to profit from the trade themselves.[19]

While conflict has inflicted significant harm on the biodiversity of the DRC, one notable exception to this trend is in forestry. The overall rate of deforestation is estimated to be around 0.33 per cent per year, which is far below that experienced in Indonesia and Liberia, and below the rates of other countries in West and Central Africa.[20] Four of these countries, Gabon, Liberia, Ivory Coast and Cameroon, had higher timber exports than the DRC, even though they contain a mere fraction of the forests of it.[21] The conflict in the country has caused many commercial logging operations to cease either temporarily, as they wait for stability to return, or indeed permanently. This slowdown has combined with the dilapidated state of the DRC's infrastructure to prevent a commercial, large-scale capital-intensive timber operation from functioning, and has helped to keep the deforestation rate down.

[14] Rene L. Beyers, John A. Hart, Anthony R. E. Sinclair, Falk Grossmann, Brian Klinkenberg and Simeon Dino, 'Resource wars and conflict ivory: the impact of civil conflict on elephants in the Democratic Republic of Congo—the case of the Okapi Reserve', *PLOS ONE* 6: 11, Nov. 2011, pp. 1–13.

[15] Laurent Debroux, Giuseppe Topa, David Kaimowitz, Alain Karsenty and Terese Hart, eds, *Forests in post-conflict Democratic Republic of Congo: analysis of a priority agenda* (Jakarta: Center for International Forestry Research, 2007), p. 15.

[16] Terese Hart, 'How many elephants are left in D.R. Congo?', field notes, 1 Feb. 2009, http://www.bonoboincongo.com/2009/02/01/how-many-elephants-are-left-in-dr-congo/, accessed 24 May 2014.

[17] Kasper Agger and Jonathan Hutson, *Kony's ivory: how elephant poaching in Congo helps support the Lord's Resistance Army* (Washington DC: Enough Project, 3 June 2013).

[18] Jeffrey Gettleman, 'Rangers in isolated Central Africa uncover grim cost of protecting wildlife', *New York Times* online, 31 Dec. 2012, http://www.nytimes.com/2013/01/01/world/africa/central-africas-wildlife-rangers-face-deadly-risks.html?ref=ivory, accessed 24 May 2014.

[19] Kristof Titeca, 'Ivory beyond the LRA: why a broader focus is needed in studying poaching', *African Arguments*, 17 Sept. 2013, http://africanarguments.org/2013/09/17/ivory-beyond-the-lra-why-a-broader-focus-is-needed-in-studying-poaching-by-kristof-titeca/, accessed 25 May 2014.

[20] Seyler et al., *Democratic Republic of Congo*, p. 9.

[21] Murl Baker, Robert Clausen, Ramzy Kanaan, Michel N'Goma, Trifin Roule and Jamie Thomson, *Conflict timber: dimensions of the problem in Asia and Africa*, vol. 3 (Burlington, VT: ARD, 2003), p. 34.

However, while the national rate of deforestation in the DRC is low, this overall figure hides significant discrepancies between deforestation rates in different regions of the country. As described above, Virunga National Park has suffered large-scale deforestation as a result of the proximity of refugee and internally displaced persons (IDPs) camps. More densely populated and easily accessible areas such as Bas-Congo and the forests around Kinshasa have also seen higher rates of deforestation.[22] In addition, much of the deforestation taking place is artisanal rather than commercial, either to provide building materials and charcoal to communities or to clear forest for agriculture. There is a danger that continued forest degradation will increase as stability and development return to the DRC.

In addition to charcoal, timber has also played a role in financing the war efforts of both rebel groups and the government. Although timber was not the main source of income for either rebels or government, revenue from its sales did contribute to their funding, particularly in government-held areas, and the destructive extraction methods used have caused further environmental harm. So although conflict timber in the DRC did not reach levels comparable to Liberia (where it was a significant source of funding for Charles Taylor after international efforts to prevent the sale of 'blood diamonds' reduced the income he could generate from diamond sales), illegal logging has helped to prolong conflict in the DRC both by providing a source of funding for rebel groups and also by acting as a deterrent to peace through the fear that it would bring to an end the revenues generated from such illegal activities.[23]

Biodiversity in the country has, then, suffered devastating impacts from conflict, while also providing sources of funding for both rebel groups and the government to sustain insecurity. While forests have largely been protected as a result of conflict, the return of peace and stability to the DRC will also bring with it commercial logging, increasing deforestation rates and, if ill-managed, will do so unsustainably. The country therefore illustrates an observation made by Jeffrey McNeely that: 'While war is bad for biodiversity, peace can be even worse … Market forces may be more destructive than military forces.'[24] The threat of peace and its implications for both the DRC and the international community are outlined in the next section.

The dangers of peace

Given the enormous damage suffered by wildlife during the wars in the DRC, peace might be expected to provide a reprieve. However, while it is difficult to predict the impacts on wildlife of a cessation of hostilities, and while peace may allow for more conservation work and projects, there is a danger that development

[22] Baker et al., *Conflict timber*, p. 51; Debroux et al., *Forests in post-conflict Democratic Republic of Congo*, p. 4.

[23] Annabelle Houdret and Christiane Roettger, *Transboundary resource cooperation in the Democratic Republic of Congo: entry points for improving regional relations* (Berlin: Adelphi Research, Feb. 2010), p. 19; Baker et al., *Conflict timber*, p. 11.

[24] Jeffrey A. McNeely, 'Overview A: biodiversity, conflict and tropical forests', in Richard Matthew, Mark Halle and Jason Switzer, eds, *Conserving the peace: resources, livelihoods and security* (Winnipeg: International Institute for Sustainable Development, 2002), p. 45.

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will lead to the destruction of habitats, while the continuing trade in bushmeat may well increase. Destruction of forest habitats through increased deforestation remains the gravest threat posed by peace to biodiversity in the DRC. The lack of regulation of the timber trade is causing environmental harm and entrenching corruption, while there is a failure to realize the true worth of timber. The DRC government tried to address this problem with the introduction of a new forestry code in 2002; but, owing to the weakness of the central state, enforcement has been lax and the measure has had minimal impact on restricting the trade.[25] This is a cause for concern not only to those interested in biodiversity conservation in the country, but also to those with a focus on humanitarian and security issues.

Not only does the DRC possess enormous biodiversity, its people are substantially dependent upon the natural environment of the country for their livelihoods, with 70 per cent of them living in rural areas and depending directly on the forests for fuel, food, beekeeping and medicinal purposes, and the ecosystem services that forests provide.[26] Because a large proportion of the population relies on subsistence farming, the combination of high levels of poverty and conflict in the country ensures that the cycle of impoverishment, environmental degradation and armed conflict remains entrenched.[27] Communities in the DRC, which are cash- and technology-poor, also lack the 'adaptive capacity' to deal with environmental change,[28] and so are heavily dependent upon ecosystem services to regulate key resources such as rainfall and soil stability for rain-fed agriculture, and to help prevent landslides and flooding. Resources such as forests and wildlife are the 'wealth of the poor',[29] and so their loss creates pressures on already weak institutions, in turn threatening to undermine post-conflict development and peacebuilding and triggering more local conflict.[30]

Small-scale farms that are rain-fed remain acutely at risk from the changing weather patterns as a result of climate change, creating longer dry seasons and less predictable rainfall. The consequences are likely to reduce soil quality and stability and diminish the ability of the country to produce enough crops to feed the population.[31] There is an added danger that if unsustainable processes are established in the post-conflict period, they may become 'locked in', leading the country on an unsustainable path that undermines long-term livelihoods and security.[32]

[25] See e.g. Debroux et al., *Forests in post-conflict Democratic Republic of Congo*; Greenpeace, *Cut it out: illegal logging in the Democratic Republic of Congo (DRC)* (Kinshasa: Greenpeace Africa, March 2013); Global Witness, *The art of logging industrially in the Congo: how loggers are abusing artisanal permits to exploit the Democratic Republic of Congo's forests* (London, Oct. 2012).

[26] Simon Counsell, *Forest governance in the Democratic Republic of Congo: an NGO perspective* (Utrecht: Forests and the European Union Resource Network (FERN), March 2006), p. 4.

[27] Houdret and Roettger, *Transboundary resource cooperation in the Democratic Republic of Congo*, p. 4.

[28] Oli Brown, Anne Hammill and Robert McLeman, 'Climate change as the "new" security threat: implications for Africa', *International Affairs* 83: 6, Nov. 2007, p. 1145.

[29] Elizabeth M. Mrema, Carl Bruch and Jordan Diamond, *Protecting the environment during armed conflict: an inventory and analysis of international law* (Nairobi: UNEP, Nov. 2009), p. 4.

[30] Jeffrey A. McNeely, 'War and biodiversity: an assessment of impacts', in Jay E. Austin and Carl E. Bruch, eds, *The environmental consequences of war: legal, economic, and scientific perspectives* (Cambridge: Cambridge University Press, 2000), pp. 373–4.

[31] UNEP, *The Democratic Republic of the Congo: post-conflict environmental assessment—synthesis for policy makers* (Nairobi, 2011), p. 43.

[32] Richard Matthew, Oli Brown and David Jensen, *From conflict to peacebuilding: the role of natural resources and the*

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Environmental degradation also poses a threat to the international community through the release of carbon that will damage the global attempt to reduce emissions. Climate change has been identified as a 'threat multiplier' to international security,[33] and thus the preservation of the DRC's key carbon sinks, estimated to hold 27,258 million tonnes of carbon,[34] is integral to combating the threat. It is estimated that by 2030, 8–9 per cent of the country's forested areas could be lost and about 15 per cent affected by degradation, which would combine to more than double the DRC's current level of carbon emissions to around 400 million tonnes.[35]

Integrating environmental considerations into post-conflict projects in the DRC is therefore not only a conservation issue, but also a development and security imperative. Such integration will require increased education to raise awareness of the value and importance of the environment to development, as well as effective mechanisms to monetize biodiversity in the country and to create alternative sources of income to ensure that conservation becomes valuable enough to prevent unsustainable exploitation of biodiversity. The next section of the article sets out the benefits these actions would bring to development and the promotion of peace in the DRC, while also controlling the level of environmental exploitation.

The value of biodiversity in the DRC

When considering how to promote economic development through biodiversity conservation, tourism—notably 'eco-tourism'—is usually presented as the solution, especially by conservation organizations, though several other NGOs and international institutions have also promoted it as a useful mechanism to achieve sustainable development.[36] The significant weaknesses of tourism generally, and particularly in insecure or post-conflict regions such as the DRC which tourists may be unwilling to visit or where the industry could be destroyed by violent events, are often overlooked. Tourism often involves the exclusion of local communities from land and resource utilization within protected areas, fuelling resentment. These same communities may also suffer from crop-raiding by wildlife, heavily detrimental to their livelihoods. Although the tourist industry may generate significant revenues, most of that income often goes to the central government and park authorities. Moreover, even when income from tourism is used for the benefit of communities, the link between what that income is spent on, such as a school, and successful conservation may not be clear.[37] The main beneficiaries of tourism will often therefore be a small number of tourist business

environment (Nairobi: UNEP, Feb. 2009), p. 6.

[33] See e.g. Chad Michael Briggs, 'Climate security, risk assessment and military planning', *International Affairs* 88: 5, Sept. 2013, pp. 1049–64; Brown et al., 'Climate change as the "new" security threat'.

[34] UNEP, *The Democratic Republic of Congo*, p. 43.

[35] UNEP, *The Democratic Republic of Congo*, p. 36.

[36] Dan Brockington, Rosaleen Duffy and Jim Igoe, *Nature unbound: conservation, capitalism and the future of protected areas* (London: Earthscan, 2008), p. 136.

[37] Adrian Martin, Eugene Rutagarama, Maryke 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.

owners and the tourists who visit the wildlife, while the surrounding communities remain deprived.[38] The potential for animosity this may create clearly threatens to undermine conservation work (which in any event is not an effective means of promoting development).[39] Two contrasting examples of gorilla conservation illustrate the strengths and weaknesses of tourism in the DRC.

Mountain gorilla conservation and the associated tourism industry have been a great conservation success story. In the early 1990s, the Rwandan government had proposed converting part of the gorilla habitat to agricultural land, but arguments from conservation organizations over the value of tourism persuaded them to maintain the protected area.[40] Since then mountain gorilla tourism has grown into a multimillion-dollar industry for Rwanda and neighbouring Uganda. The DRC has been less able to capitalize on tourism, however, because persistent insecurity in North Kivu has disrupted attempts to build up the industry. A revenue-sharing scheme has been set up to help the DRC generate income from the gorilla groups that are established in that country but are visited by tourists in either Rwanda or Uganda. The scheme has enabled the Congo to receive some benefits from gorilla conservation, but these are still limited. Community livelihood projects have also been established, along with a community revenue-sharing scheme to use funds for projects that help local communities reap indirect benefits from the development of tourism, such as the construction of water tanks. However, the population density around the gorilla habitat is high, limiting the reach of these projects. For example, in Rwanda the revenue-sharing scheme amounts to just US$0.36 per person per year.[41]

In spite of these limitations, such schemes should be considered a success given that the mountain gorilla population continues to grow, even in such a poor and often insecure environment as the Virungas. However, notwithstanding the success of mountain gorilla conservation, tourism has not been successful in South Kivu, the habitat of the eastern lowland gorilla. A hundred tourists per month represent a success in KBNP,[42] whereas the mountain gorillas may receive more than that number in a single day. The eastern lowland gorilla conservation effort in KBNP is far less well resourced than the mountain gorilla work in the Virungas. This species therefore suffers not only from being in the shadow of the better-known mountain gorilla, but also from the further effects arising from the perception of the DRC as unsafe and the consequent lack of tourist infrastructure to encourage visitors.

[38] Andrew M. Lemieux and Ronald V. Clarke, 'The international ban on ivory sales and its effects on elephant poaching in Africa', *British Journal of Criminology* 49: 4, 2009, pp. 451–71.

[39] Rosaleen Duffy, *Nature crime: how we're getting conservation wrong* (New Haven, CT, and London: Yale University Press, 2010), p. 45.

[40] Annette Lanjouw, 'Building partnerships in the face of political and armed crisis', *Journal of Sustainable Forestry* 16: 3–4, 2003, pp. 89–110.

[41] Hannah Nielsen and Anna Spenceley, 'The success of tourism in Rwanda: gorillas and more', background paper for the African Success Stories Study, April 2010, p. 9, http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/Tourism_Rwanda.pdf, accessed 24 May 2014.

[42] 'Tourism is blooming as Kahuzi Biega National Park goes beyond 100 visitors a month', Kahuzi-Biega National Park Official Blog, 8 Nov. 2012, http://kahuzibiega.wordpress.com/2012/11/08/tourism-is-blooming-as-kahuzi-biega-national-park-goes-beyond-100-visitors-a-month/, accessed 24 May 2014.

These two examples illustrate that tourism is not a panacea for problems of conservation and development. There are two main reasons why the potential for expanding gorilla tourism is limited. First, expense; second, gorilla family groups are often small and difficult to locate. With regard to the latter there is therefore a need to restrict the number of family groups that could be habituated to tourism owing to the danger of spreading human diseases such as influenza to the groups with possible fatal results. There is a risk in placing too much emphasis on the benefits of tourism; as a result, projects that aim to garner more support for conservation by educating communities about the value of the forests for their ecosystem services may be ignored.[43] The perception of tourism as a 'magic bullet'[44] often distracts attention from the need to find other methods of generating income from conservation. While tourism can provide limited benefits, it is not enough in itself to achieve effective conservation and development outcomes.

Before examining alternative methods of generating cash income directly from biodiversity, non-monetary services and their value provided by biodiversity should be considered. The essential role that ecosystem services and the natural resource base play in supporting the livelihoods of the population of the DRC has been described above, but this is often overlooked in development work. This value needs to be better appreciated and supported. There is a critical need for increased awareness of the value of the environment at a community level to ensure that the key resources on which communities rely for survival are sustainably managed, and that they continue to gain access to those resources.

Consequently, there is an accompanying need for a shift in policy, on the part of both government and development NGOs, for better integration of environmental considerations and conservation into development work. The requirement here is to establish programmes that help to improve the understanding of the value and importance of the environment among communities and local government, and to apply pressure to change national laws to integrate better environmental protection. Conservation organizations also need to engage in greater cooperation with development and humanitarian organizations to improve the perception and reach of conservation. In other words, environmental concerns need to be integrated into humanitarian and development programmes.[45] Not only would such approaches enhance effective and cost-efficient methods to achieve conservation, they would also greatly increase the capacity of communities to engage in sustainable development by protecting the natural resource base upon which they depend for their livelihoods.

While education is important, it takes time for attitudes and approaches to change, and even with education, environmental degradation and unsustainable

[43] Eric van de Giessen, *Peace park amid violence? A report on environmental security in the Virunga–Bwindi region* (The Hague: Institute for Environmental Security, July 2005), p. 27.

[44] Brockington et al., *Nature unbound*, p. 136.

[45] 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).

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use are likely to take place. It is therefore important that educational efforts are supported by programmes that generate cash revenues for conservation, in the form of payment for ecosystem services (PES) schemes. These schemes not only help to protect valuable biodiversity and associated ecosystem services, but also provide much-needed income for a country to help it develop sustainably, while also demonstrating the value of biodiversity in more tangible terms than education alone can do. With the international effort to combat climate change by reducing carbon dioxide emissions, the DRC's forest resource has become very valuable, and attempts are being made to realize that value through the Reduced Emissions from Degradation and Deforestation (REDD+) scheme. This is a PES scheme that provides financial incentives to protect forests and carbon stocks in developing countries in order to encourage sustainable development.

The DRC has the potential to earn US$1 billion from carbon markets,[46] using programmes like the REDD+ and related carbon schemes such as the Ibi Batéké carbon sink plantation (IBCSP). The IBSCP is a private initiative that is establishing large-scale plantations to reduce deforestation, creating a carbon sink to attract funding from the carbon market and also engaging in managed harvesting of some of the plantation to produce charcoal and food crops.[47] These two initiatives have shown great potential both to conserve forestry in the DRC and to generate income from conservation. Several problems, however, have been encountered in both schemes, particularly with regard to achieving certification and implementing effective governance frameworks, which is difficult to achieve in a country such as the DRC where the reach of the state is minimal, governance is poor and corruption levels are high.[48] There are also reservations over land use and ownership, and concerns that communities may not receive the full benefits of these schemes.[49] These problems are not insurmountable, however, and schemes such as the IBCSP have demonstrated the value of persisting with them. More schemes need to be rolled out through the DRC to capitalize on the value of the global carbon market and to improve the quality of these programmes.

Carbon-based schemes are a useful way to provide incentives to protect forests that benefit both the DRC as a whole and the communities living close to forests. There is a danger, though, that the market for carbon may distort conservation efforts, driving them towards carbon sequestration projects at the expense of other important biodiversity conservation initiatives.[50] For example, growing trees sequester more carbon than mature forest, so there may be preferences towards funding growing forests. Such an emphasis could lead established forests to suffer,

[46] UNEP, *The Democratic Republic of Congo*, p. 66.

[47] For a summary of this project, see: http://postconflict.unep.ch/congo/en/content/ibi-bateke-carbon-sink-plantation-ibcsp, accessed 24 May 2014.

[48] André Aquino and Bruno Guay, 'Implementing REDD+ in the Democratic Republic of Congo: an analysis of the emerging national REDD+ governance structure', *Forest Policy and Economics*, vol. 36, 2013, pp. 71–9.

[49] Dennis Tänzler, 'Forests and conflict: the relevance of REDD+', in Geoffrey D. Dabelko, Lauren Herzer, Schuyler Null, Meaghan Parker and Russell Sticklor, eds, *Backdraft: the conflict potential of climate change adaptation and mitigation*, Environmental Change and Security Program Report, vol. 14, no. 2 (Washington DC: Woodrow Wilson International Center for Scholars, 2013).

[50] Jonah Busch, *Supplementing REDD+ with biodiversity payments: the paradox of paying for multiple ecosystem services*, CGD Working Paper 347 (Washington DC: Center for Global Development, 2013).

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and in turn cause degradation of biodiversity habitats within those forests or within other areas of low carbon sequestration.[51]

Suggestions have been put forward that PES schemes be established that fund biodiversity conservation in addition to PES for carbon. This funding could be provided in one or more ways: through charitable donations, individual purchases of permits for PES, donations from business, and other more novel approaches such as the proposal for cash-for-conservation swaps in Liberia as a potential means of support for conservation.[52] Efforts at establishing such arrangements have been made, but the income generated from them so far is modest.[53] The principle behind these kinds of ideas remains sound, but the mechanism of achieving a successful international PES scheme for biodiversity still needs to be improved. If such schemes could be established, the DRC would be in a strong position to gain significant revenue from them.

PES schemes therefore show potential as sources of income, but some of the problems of implementation and methodology still need to be resolved. Moreover, even if they were resolved PES schemes would not provide all the income necessary to fund conservation work. Alternative approaches that focus on job creation associated with conservation offer another means of generating income from biodiversity conservation with a view to filling the gap.

The growing popularity of product certification schemes such as Fairtrade, the Forest Stewardship Council (FSC) and the Rainforest Alliance offer the potential for the DRC to generate income by producing products with such certification. A particularly promising idea in this respect is to scale up current conservation livelihood projects run by gorilla conservation organizations, such as those that train ex-poachers to produce gorilla carvings. In this way communities living close to gorilla habitats and former poachers would craft 'gorilla friendly' certified products that could be sold in international markets. These initiatives are all part of a broader effort to create an 'eco-man friendly' certification scheme, similar to the current Fairtrade and FSC schemes, which would be designed to encourage the growth of businesses making products designed to promote simultaneously conservation and development.[54]

Such a certification scheme could be a significant source of income and jobs for conservation in the DRC. Not only could a certification initiative work directly by providing work to communities that protect biodiversity, but the certification could also be given to other products that give a percentage of profits to supporting biodiversity conservation.[55] Money could be either given to support

[51] Sheila Wertz-Kanounnikoff, *Payments for environmental services: a solution for biodiversity conservation?* (Paris: IDDRI, 2006).

[52] Ken Conca and Jennifer Wallace, 'Environment and peacebuilding in war-torn societies: lessons from the UN Environment Programme's experience with postconflict assessment', *Global Governance* 15: 4, 2009, pp. 485–504.

[53] Lars Hein, Daniel C. Miller and Rudolf de Groot, 'Payments for ecosystem services and the financing of global biodiversity conservation', *Current Opinion in Environmental Sustainability* 5: 1, 2013, pp. 87–93.

[54] John Kahekwa, 'Planting the seeds for development', *Business Fights Poverty*, 19 Nov. 2012, http://community.businessfightspoverty.org/profiles/blogs/planting-the-seeds-for-development, accessed 24 May 2014.

[55] For example, a chocolate bar in the shape of a gorilla could be certified as 'eco-man friendly' if a share of the profits from the sale of those bars was donated to funding gorilla conservation initiatives.

programmes like the Global Environment Facility, or channelled into a new fund that would act as an international PES scheme for biodiversity conservation, providing funding to conservation organizations and projects. This would be particularly valuable in regions suffering from armed conflict, providing sources of funding for projects that would be contingent not upon results, as for example REDD+ is, but upon the need to mitigate the negative impacts of conflict. A fund of this kind could therefore support conservation projects during armed conflict—when other donor funding is often cut—to ensure that those organizations maintain a presence during times of conflict as a platform from which programmes can be quickly resumed when security returns.[56] The success of certification systems such as Fairtrade and the willingness of consumers to pay slightly more for these products, combined with the enduring popularity of wildlife, suggest that such a scheme could be a successful mechanism to generate income for biodiversity conservation in the DRC.

While biodiversity protection can generate income and provide jobs, a well-managed, sustainable timber logging industry offers the potential for large revenues in a fairly low-carbon industry that also helps protect biodiversity. Logging in the DRC is currently highly unsustainable and financially unequal, with money going to large firms and the value of timber not being fully realized.[57] Taking control of this industry to improve its management with more equally spread benefits would not only generate more income but also preserve valuable ecosystem services. It is estimated that such an industry could generate US$810 million per year.[58] As forests around the world continue to be depleted, the value of a well-managed timber industry increases and is a viable option for a country such as the DRC. The industry offers the potential for job creation in processing as well as logging, helping to ensure the full value of the timber is realized, since the value of well-processed timber is several times the value of roughly sawn logs in their most basic, unprocessed state.[59] Establishing a functioning, multilevel industry not simply based on logging will not be easy to achieve, and efforts to regulate the industry to date have been of limited effectiveness, but the value of a regulated industry for the DRC makes it a goal worth pursuing.

Finally, there are specific schemes appropriate to regions of armed conflict that combine conservation with efforts to provide work for former rebel soldiers. In Afghanistan, for example, the Afghanistan Conservation Corps provides work for former armed rebels such as planting and harvesting pistachio forests; and in several countries, such as Mozambique, former rebels have been employed as park

[56] Judy Oglethorpe, James Shambaugh and Rebecca Kormos, 'Parks in the crossfire: strategies for effective conservation in areas of armed conflict', *War and Protected Areas* 14: 1, 2004, pp. 2–8; Andrew J. Plumptre, 'Lessons learned from on-the-ground conservation in Rwanda and the Democratic Republic of the Congo', *Journal of Sustainable Forestry* 16: 3–4, 2003, pp. 69–88.

[57] Greenpeace, *Cut it out*; Global Witness, *The art of logging industrially in the Congo*.

[58] Nadine Laporte, Frank Merry, Alessandro Baccini, Scott Goetz, Jared Stabach and Maria Bowman, *Reducing CO_2 emissions from deforestation and degradation in the DRC: a first look* (Falmouth, MA: Woods Hole Research Center, 2007), p. 14.

[59] Baker et al., *Conflict timber*, p. 64.

rangers.[60] A suggestion has also been made that thousands of jobs could be created in Liberia to protect national parks and create a sustainable timber industry. There, work is being carried out to create a Civilian Conservation Corps that would provide infrastructure for communities, such as schools and hospitals.[61]

Various approaches to providing conservation jobs for former rebel soldiers have the potential to yield results for both peace and conservation in the DRC.[62] These approaches could be brought together and expanded under the proposed 'Yellow Berets' scheme, a project for the creation of units of ex-rebels under neutral command of either the UN or the African Union. These units would carry out environmental protection and sustainable exploitation work, for example through the expansion of the legal, regulated timber industry—an attractive solution to both conservation and reintegration challenges. However, there is a need for caution. Both the continuing failures of reintegration schemes in the DRC to date and the enduring cycle of conflict in the east of the country attest to the difficulties of achieving an enduring peace. A Yellow Berets scheme needs to be formulated and implemented with great care if it is to play an effective part in addressing the myriad issues that create and sustain insecurity in the region.[63]

The Yellow Berets scheme nevertheless offers the potential for a successful reintegration programme helping to protect the environment in eastern DRC and creating a foundation for sustainable economic growth.[64] The initiative would also facilitate the conversion of the current threat of insecurity in the DRC into a mechanism for peaceful development. It could also provide a cost-effective way to assist in the protection of environmental and other NGO projects, as well as generating a body of people large enough to engage in sustainable exploitation of the environment to create a platform for development. Finally, the provision of jobs would help to reduce the incentives for joining rebel militias, thereby improving the chances of avoiding future conflict and consolidating peace. Large-scale disarmament, demobilization and reintegration schemes may currently be few, but as the importance of the environment is realized and its protection and sustainable utilization become higher priorities, such projects offer scope for successful future projects bringing dividends for peace and development.

Conservation for development

Biodiversity is not usually considered an important issue in the immediate aftermath of conflict, when the short-term needs of human victims and the need for

[60] UNEP, *Greening the blue helmets: environment, natural resources and UN peacekeeping operations* (Nairobi, May 2012), p. 68.

[61] Arthur G. Blundell and Tyler Christie, 'Liberia: securing the peace through parks', in Saleem H. Ali, ed., *Peace parks: conservation and conflict resolution* (Cambridge, MA, and London: MIT Press, 2007).

[62] UNEP, *The Democratic Republic of Congo*.

[63] These myriad problems are described in the publications of the Rift Valley Institute's Usalama Project. See Jason Stearns, *From CNDP to M23: the evolution of an armed movement in eastern Congo* (London and Nairobi: Rift Valley Institute, 2012); Jason Stearns, *North Kivu: the background to conflict in North Kivu province of eastern Congo* (London and Nairobi: Rift Valley Institute, 2012).

[64] Richard Milburn, 'Mainstreaming the environment into postwar recovery: the case for "ecological development"', *International Affairs* 88: 5, Sept. 2012, pp. 1083–1100.

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peacebuilding and conflict transformation take precedence over environmental considerations. However, environmental considerations are themselves often highly relevant to human welfare because environmental degradation and the illegal trade in wildlife and timber all harm livelihoods and sow the seeds of conflict.[65]

All too often there is a perception that in order to conserve biodiversity, resources need to be taken away from humanitarian projects, harming human recipients of support for the sake of protecting wildlife. This creates a false dichotomy between conservation and development. It overlooks the key role that biodiversity plays in development and the valuable services conservation initiatives can provide to people who are heavily dependent on the country's natural resource base for their survival. While armed conflict is very damaging to biodiversity, the post-conflict period can be even more so. Environmental degradation merely further undermines the natural resource base upon which people depend, reducing the ability of societies to recover from conflict and to develop, and thus increasing the chances of another outbreak of conflict.[66] In a region of armed conflict, at issue is not a choice of conservation *or* development, but a necessity to engage in conservation *for* development.

There have been significant steps towards approaches that offer much promise for the future. In a previous article by the author, the concept of 'ecological development' was presented and analysed as a means to move beyond sustainable development to mainstream the environment into conflict and post-conflict work, using it as a tool to improve security, peacebuilding and governance and to promote development.[67] Other projects are already under way to integrate better the environment into post-conflict development, such as the UNEP's disasters and conflict programme.[68] Further work is being done to realize the importance and value of the environment to development through the UNDP–UNEP Environment–Poverty Initiative,[69] and also the Economics of Ecosystems and Biodiversity (TEEB) initiative,[70] which seeks to establish more firmly the value of the environment and help generate a greater appreciation of that value at all levels of society, from communities and local government and businesses up to national government, international institutions, development NGOs and international corporations.

The key component of such schemes is a focus on the human utility of the environment as opposed to arguments about the intrinsic value of biodiversity and animal rights. While the latter line of argument is certainly not invalid, it is often ineffective, particularly in a post-conflict context where the toll of human suffering is so great it often overwhelms consideration of wildlife. Consequently, arguments about the intrinsic value of biodiversity may serve to demonize conservation as it is perceived as wildlife taking precedence over people. In such contexts it is important to present the instrumental values of biodiversity in order for the

[65] Austin and Bruch, eds, *The environmental consequences of war*, p. 5.
[66] Conca and Wallace, 'Environment and peacebuilding in war-torn societies', p. 485.
[67] Milburn, 'Mainstreaming the environment into postwar recovery'.
[68] See http://www.unep.org/disastersandconflicts/, accessed 24 May 2014.
[69] See http://www.unpei.org/, accessed 24 May 2014.
[70] See http://www.teebweb.org/, accessed 24 May 2014.

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arguments to gain a genuine hearing. As Pavan Sukhdev, TEEB study leader, states: 'Economics is the language of policy,'[71] and therefore arguments for biodiversity need to be presented in that language.

A most promising development on this front is the growing appreciation among business of the importance and value of the environment, fostered through efforts to encourage businesses to realize the value of natural capital in the products they make as well as the risk posed by environmental degradation to their supply chains and future profits.[72] Investors are demanding reports on environmental threats from firms and these are proactively engaging in environmental protection work, not simply as a process of 'green-washing' to improve their public relations but as a serious strategy of risk mitigation to prevent environmental degradation from harming future profits.[73]

A significant shift in thinking about biodiversity is needed. Conservation is not about denying access to resources in a form of preservation, but about providing the protection that is necessary to avoid tragedies of the commons that lead to long-term human detriment, and protecting and sustainably exploiting biodiversity as a valuable asset.

The approach to conservation suggested in this article contains a twin emphasis, stressing that biodiversity offers the provision of monetary income—whether from tourism, timber sales, PES schemes such as REDD+, or the biodiversity schemes outlined above—as well as valuable in-kind benefits by providing ecosystem services that are crucial to development. Biodiversity should be seen as a renewable resource and an asset that, if sustainably managed, will maintain its underlying value and continue to pay dividends in perpetuity,[74] unlike other natural resources such as coltan, oil or diamonds, which offer only a one-off sale to realize the cash value of the asset, after which that asset is lost. Conservation is a crucial part of development to protect and effectively use these valuable assets.

Crucially, more innovation is required to find methods that effectively monetize the value of biodiversity to generate income that supports conservation and development work and is not dependent upon the limited sources of tourism and charitable donations. Such an emphasis aims to provide mechanisms for people around the world who value biodiversity to buy goods and services that are useful to them and useful to conservation.

A pillar, not a panacea

Even if biodiversity in the DRC is protected and used sustainably, and its in-kind and monetary benefits are fully realized, this will not by itself bring peace and development to the country and its population. For example, complex issues

[71] http://www.teebweb.org/about/, accessed 24 May 2014.
[72] Economist Intelligence Unit, *Revaluing ecosystems: visions of a better future* (London, 2014).
[73] 'A green light', *The Economist*, 29 March 2014.
[74] Richard Milburn, 'Gorillas and guerrillas: environment and conflict in the Democratic Republic of Congo', in Avi Brisman, Nigel South and Rob White, eds, *Environmental crime and social conflict: contemporary and emerging issues* (Aldershot: Ashgate, forthcoming).

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relating to land rights still need to be resolved to overcome tensions between groups that have led to armed conflict.[75] In addition, the corruption that is endemic to the country needs to be resolved, and biodiversity conservation can exert only a very limited impact upon this process. Furthermore, as outlined in this article, governance in the DRC remains poor; the reach of the state is limited and its effectiveness is weak, creating institutional problems that prevent change. While biodiversity conservation work could help to improve governance by improving the capabilities of one arm of the state, the ICCN, this may well have only limited effects on the broader weakness of governance in the country.

The DRC and its conflicts remain complex and often poorly understood, with multiple actors and interests in a country the size of western Europe that is beset by a whole host of problems which will require significant resources and decades of carefully considered projects to resolve.[76] Clearly, therefore, biodiversity protection and monetization on their own will not solve these problems and bring peace and development to the DRC. Equally, though, the DRC will not be able to move onto a path of sustainable and resilient development without due consideration and effective, sustainable utilization of biodiversity in the country.

Therefore, while biodiversity conservation is certainly not a panacea for the DRC, it still deserves greater consideration in the multidimensional process required to improve security and promote development in the country. Ignoring the environment poses threats to security and undermines development, whereas integrating biodiversity considerations into security and development work improves both processes.

Conclusion

With some exceptions, notably rates of deforestation, conflict has inflicted devastation upon biodiversity in the DRC. Moreover, the prospect of peace seems set to do still further harm. This is of obvious concern to those interested in conservation, but it should also be a concern for those more interested in security and development. Biodiversity is critically important to the livelihoods of millions of people in the DRC; its destruction and degradation undermine development and contribute to insecurity not only within the country, but also regionally and internationally, through the threat multiplier of climate change. The situation may seem dire, but there is the chance to turn a threat into an opportunity by realizing the value of biodiversity in the country and using it to promote development while protecting key ecosystems, species and carbon sinks.

While biodiversity is crucial for security and development, it is important not to overstate its value and risk contributing to 'environment fatigue'. Biodiversity conservation can only form part of the broad multi dimensional programmes

[75] Chris Huggins, *Land, power and identity: roots of violent conflict in eastern DRC* (London: International Alert, Nov. 2010).

[76] See e.g. Theodore Trefon, *Congo masquerade: the political culture of aid inefficiency and reform failure* (London and New York: Zed, 2011); Stearns, *Dancing in the glory of monsters*; Gérard Prunier, *From genocide to continental war: the 'Congolese' conflict and the crisis of contemporary Africa* (London: Hurst, 2009).

required in the country because it cannot address all of the myriad problems that prevent the DRC from achieving peace and post-conflict development. While it cannot solve these issues, it can contribute towards addressing some of them, such as improving land rights, which in turn can contribute positively to the process of post-conflict development. Equally, failing to adequately protect and utilize biodiversity undermines the quality of the broader process of post-conflict development in the DRC. Biodiversity conservation should therefore form a core pillar of the process of bringing security and development to the DRC.

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