



Cyprian Aleksander Kozera:¹ Climate Change and Violent Conflicts – Towards Establishing a Connection. Studies from Rapa Nui and East Africa²

Executive summary

- Rapa Nui, or Eastern Island, is an isolated tiny piece of land in the Pacific, known for its stone carved statues erected between 11th and 17th centuries, A.D. The remote island was inhabited by up to fifteen thousand people. The construction abruptly stopped, marking the end of cultural development of the island-dwellers, most probably due to deforestation, following soil erosion and conflicts over scarce resources. At the time of the European arrival to the island in 1722, the island counted less than three thousand people and lacked high-tree forests. The decline of the island culture and environment might have been anthropogenic (started by the deforestation) or climate-related (e.g. droughts brought by El Niño – Southern Oscillation), or both as demographic pressure on the environment (e.g. total eradication of the high woodland and plants necessary for producing ropes and canoes), might have made subsequent environmental degradation much easier. The case of Rapa Nui shows how vulnerable human societies are to the degrading environmental conditions and how environmental depletion may lead to conflicts due to the scarcity of resources.
- According to IPCC forecasts, climate change causes significant changes in weather patterns with more extreme climate events, thus creating not only warmer but harsher and less predictable climate conditions, to which accommodation will be more difficult. If global temperatures rise by 3°C to 4°C from the pre-industrial level (by now the temperature has already increased by 0.8°C), extreme weather events will become over ten times more common than in 2010. We will face major species extinction, environment forced mass migration, and conflicts over resources.
- Tackling global warming now would cost between two to three percent of the world's GDP, but by the middle of the century its costs would rise to twenty percent of the world's GDP.
- In Africa “[c]limate change and climate variability have the potential to exacerbate or multiply existing threats to human security including food, health, and economic insecurity” – IPCC report states. Consequently, climate change is considered an important exacerbating variable of armed conflicts. The ongoing genocidal conflict in Darfur (Sudan) has been dubbed ‘the first climate war’.
- Examining the East African cases, we can observe an indirect, yet continuous and contiguous, relation between climate change and violence. Climate change and variability worsen livelihood conditions, what may increase migration and change pastoral mobility patterns, increase armed group recruitment, and increase risk of violent resource competition, leading to the outbreak of violence.
- Our environment is significantly changing, and the change is imminent. The anthropogenic climate-related environmental changes cause tensions among peoples and exacerbate violent conflicts. One of East Africa's worst tragedies in recent history, the genocide in Darfur, illustrates how a conflict, driven by a degrading environment can drastically escalate when brutally and mercilessly exploited by political elites. With continued global warming and rising demographic pressure, the conditions on the African continent will become harsher, desertification and deforestation will progress, soil erosion will follow, agriculture crops diminish, and thus the conflict potential will increase.

¹ Cyprian Aleksander Kozera, PhD, is a lecturer and researcher at the War Studies University, Warsaw (formerly known as the National Defence University, Warsaw); contact: kozeracyprian@gmail.com.

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The contentious case of Rapa Nui

When Europeans, for the first time, arrived at the shores of a tiny and remote Pacific island on the Easter Sunday of 1722 (hence its later name: Easter Island – or Rapa Nui), the grandeur of this isolated land had disappeared a long time ago. Not much was left of the period of intense social and cultural development, symbolised by enormous stone sculptures – worldwide known as *moai*, statues of the forefathers. According to estimations, the population of Rapa Nui crippled due to malnutrition and a violent struggle for scarce resources, declining from around ten, perhaps more than fifteen thousand inhabitants to less than three thousand in the eighteenth century.³ The major cause of the island's crisis is lively debated: the main discourse states that it was an anthropogenic (self-inflicted) environmental change, while the other points to climate-related disasters, or even both. Thus, it may have been the inhabitants' activity that led the island into decline or a climate-related hazard. It was definitely a complex development, involving a chain of events, leading to effective degradation of the whole eco- and social system. Whatever was the cause of the crisis, the final blow to the culture and society of Rapa Nui was delivered by the whalers and slave raiders from South America, bringing in formerly unknown diseases – the island's already weakened population was utterly decimated, with barely over a hundred survivors left at the end of the nineteenth century.⁴

The volcanic island lies about two thousand kilometres away from the nearest inhabited land (the tiny Pitcairn island is 2112 km away) and was colonised by Polynesian master sailors sometime between the 8th and 12th centuries, who arrived on their canoes accomplishing an extraordinary journey through the Pacific.⁵ During the unchallenged reign of the Rapa Nui settlers on the island until the 18th century, the society created a unique culture with its own writing system and proficiency in stone carving. Between the 11th and 17th centuries eight hundred eighty-seven *moai* statues were erected in total and then ceased to be constructed.⁶ Interestingly, in this period, the size of woodland and the population decreased, and thus the decline of Rapa Nui culture followed.

When the first settlers arrived to this remote island, the land was heavily covered with palm forests and the wildlife flourished. There might had been around sixteen million ten to twenty metres high

³ For detailed estimation on Rapa Nui's population before the arrival of Europeans see: PULESTON, Cedric O. et al.: Rain, Sun, Soil, and Sweat: A Consideration of Population Limits on Rapa Nui (Easter Island) before European Contact. *Frontiers in Ecology and Evolution*. 10 07 2017.

⁴ The cause and even self-inflicted character of Rapa Nui's degradation is still debated within the academic community. Some, as for example the illustrious academic Jared Diamond, argue that it was entirely self-imposed, anthropogenic and environmental (DIAMOND, Jared: *Collapse: How Societies Choose to Fail or Succeed*. Viking Press, New York, 2005), though others criticise his conclusions pointing out the unreliability of sources and that he omitted the role of Europeans' even more disastrous impact on the island (PEISER, Benny: From Genocide to Ecocide: The Rape of Rapa Nui. In: *Energy & Environment*, Vol. 16, No. 3-4, 2005, pp. 513-539; MCANANY, Patricia A. – YOFFEE, Norman: *Questioning Collapse: Human Resilience, Ecological Vulnerability, and the Aftermath of Empire*. Cambridge University Press, Cambridge, 2010). However, what remains factual is that the island's society culturally degraded long before the arrival of Europeans in the eighteenth century and most of the forests were already cut.

⁵ The date of the first colonisation also remains contested, as recent radiocarbon dating moved the arrival of the first settlers to ca. 1200, though others point to around the 7th century. Source: HUNT, Terry L. – LIPO, Carl P.: Late Colonization of Easter Island. *Science*, Vol. 311, No. 5767, 2006, pp. 1603-1606; FISCHER, Steven Roger: *Island at the End of the World. The Turbulent History of Eastern Island*. Reaktion Books, Trowbridge, 2005, p. 6.

⁶ BAHN, Paul G.: The history of human settlement on Rapa Nui. In: *Easter Island Studies* (FISCHER, Steven Roger (ed.): Oxbox Monograph 32. The Short Run Press, Oxford, 1993, pp. 53–55. as quoted by: MANN, Daniel. et al.: Prehistoric Destruction of the Primeval Soils and Vegetation of Rapa Nui (Isla de Pascua, Easter Island). In: LORET John – TANACREDI, John T. (eds.): *Easter Island*. Kluwer Academic / Plenum Publishers, New York, 2003. See also: DRANSFIELD, John – FLENLEY, John R. – KING, Sarah M. – HARKNESS, Douglas. D. — RAPU, Sergio: A recently extinct palm from Easter Island. In: *Nature*, Vol. 312, 1984, pp. 750-752. as quoted by: PEISER, p. 519.

indigenous palm trees,⁷ and small trees like *Sophora toromiro*, while shrubs also grew in abundant amount. The fauna counted numerous species (with the exception of land mammals), also many endemic, and mainly marine – seabirds, turtles, fish, etc. Yet the Polynesian colonisation (not only on Rapa Nui) was characterised by any lack of awareness of sustainability: “[a]s the centuries passed, they continued to burg vegetation and clear forest over the entire island without regard to the consequences, ravishing the resources...”⁸ As the population expanded,⁹ the pressure on the environment went beyond its ability to recover. By the middle of the 17th century the high-forests were almost entirely cut, the soil eroded, most of the endemic species went extinct. By that time, the great stone statues ceased to be erected,¹⁰ what “may have been caused by the extinction of the palm trees”,¹¹ or rather due to a dramatic social change. Perhaps instead, or at least simultaneously, tiny wooden figures, *moai kavakava*, were carved of small trees (*Sophora toromiro*), that were growing on the island and were never entirely cut off.

The wooden *kavakava* figures represent skinny, bended people with visible ribs and swollen belly. A forty-four centimetres high sculpture from the collection of the Royal Museums of Art and History in Brussels (classified as ET 48.63) might come from the period of the 14th to 15th centuries, as an initial carbon dating shows.¹² The emaciated character of this and other similar wooden *moai* statuettes may be a stylistic convention, as the researchers examining this case claim, pointing to the period prior to the European contact period of their carving.¹³ Here, the authors relying on data from radiocarbon dating (which itself, as a method, is not entirely reliable when based on a single sample) seem to ignore the fact, that by the time Europeans started to arrive in the island (18th century), the population had already decreased and high palms forest had gone extinct (ca. 17th century), thus possibly creating conditions for food scarcity (due to animals’ extinction, soil erosion, etc.),¹⁴ and making the figures more an illustration of the reality, a sign of malnutrition or even starvation, than “primarily a cultural–artistic convention”.¹⁵ Especially given the fact, that the ET 48.63 statuette is rather detailed in depicting an image of a malnourished person. If so, it still remains to be confirmed, whether it was a malnutrition typically occurring among the Rapa Nui inhabitants, (since they occasionally suffered from food shortages, not acute though)¹⁶ or a depiction of a broader phenomenon of prolonged starvation.

To understand the case of Rapa Nui’s environmental crisis, the relation between the people and the woodland seems crucial. Until recently, it has been suggested that the construction of huge stone

⁷ *Paschalococos disperta* or *Jubaea disperta*, an endemic palm similar to the Chilean wine palm.

⁸ FISCHER, p. 9.

⁹ All exact estimations about the number of population are highly speculative, though there is a consensus that at its peak it was much higher than the estimated 1500 to 3000 upon the first Europeans contact, reaching up to circa 17500, based on newest ecological assumptions (See: PULESTON et al.).

¹⁰ This is contested too, among others by Peiser, who quotes testimonies of Métraux and Lavachery stating that the construction of statues lasted into the 18th century, until slave-raiders decimated the remaining Rapa Nui inhabitants. PEISER, p. 527.

¹¹ DRANSFIELD et al., pp. 750-752, as quoted by: PEISER, p. 519.

¹² A single ‘Carbon-14’ dating, though, is often misleading and certainly not enough to establish an exact period of the *moai kavakava* figures woodcarving, as the authors stipulate that “additional radiocarbon measurements will have to be produced for similar sculptures to validate the age obtained for ET 48.63 and to determine more closely the origin and time span of the Rapanui woodcarving tradition”. FORMENT, F. – HUYGE, D. – VALLADAS, H.: AMS 14C age determinations of Rapanui (Easter Island) wood sculpture: moai kavakava ET 48.63 from Brussels. In: *Antiquity*, Vol. 75, No. 289, 2001, p. 532.

¹³ FORMENT – HUYGE – VALLADAS, p. 532.

¹⁴ See: PULESTON et al.

¹⁵ FORMENT – HUYGE – VALLADAS, p. 532.

¹⁶ HUNT, Terry – LIPO, Carl: *The Statues that Walked: Unravelling the Mystery of Easter Island*. Free Press, New York, 2011, p. 142.



Center for Strategic and Defense Studies

CSDS Viewpoints 2018/5.

structures required timber – similarly as in the case of the ancient Egyptians who were building pyramids, the stones were laid horizontally and rolled on wooden logs. When there was no timber left, the *moai* construction came to an end. Although, as recent experiments based upon archaeological findings revealed, the giant statues might have been “walked” in a vertical position (as we sometimes move a refrigerator), being pulled with ropes from side to side, and thus transporting them from the quarry to their destination.¹⁷ Here, the timber is not necessary for transportation purposes (but still might be needed for the carving stage, e.g. for building scaffoldings).

However, the role of palms has been certainly much more complex. Besides their role for statues construction, they were also used to carve canoes (and for several hundred years the islanders kept social and trade links with “neighbouring” lands, often travelling three weeks or more in their boats).¹⁸ Palm leftovers served for house construction purposes, like roof tiling, and were used as fuel for fire. The palms were as well a precious source of water as its fresh sources were scarce. On the volcanic island, where it was hard to collect rainwater on a porous soil, and access to few water sources was limited by distance, taboos and clan boundaries, a chopped single palm could have provided even several litres of liquid palm sap per day for weeks (not to mention its high-calorie nutritional value).¹⁹ The palm, therefore, was an important, if not a crucial, part of the island ecosystem.

According to Cardinali et al., the extensive deforestation commenced in the 14th century and lasted until the last indigenous palm was chopped about four hundred years later.²⁰ The environmental and social changes that followed were dramatic – as the authors state: “many other tree and shrub species as well as most of the endemic forest fauna disappeared... the Rapa Nui lost all resources linked to former woodlands”. That includes material for construction of statues, houses, and canoes (allowing fishing and exchange with other lands); a precious source of liquid and nutrition, as well as fuel for fire. Last but not least, the open space gave no shelter from the strong oceanic winds and burning sun, to which agricultural crops were exposed. Thus, without these high trees, soil dried and eroded, further reducing the crops’ yields.²¹ Even a fierce opponent of the theory of self-inflicted environmental collapse on Rapa Nui, Benny Peiser admitted that “[t]he disappearance of the palm, whenever it may have occurred, undoubtedly placed a considerable limit on Easter Island’s ecology and culture.”²²

The anthropogenic devastation of the ecosystem, as every hypothesis or theory concerning Easter Island, is not uncontested. Catherine and Michel Orliac provided an opposing hypothesis pointing to the role of a climate-induced environmental change, though they do not deny its impact on the society. Cardinali et al., quoted previously had claimed that the soil erosion limited the agriculture and caused deposition of sediments (what impacted settlements), and forced people to migrate to other locations, what “may have resulted in problematic social consequences as the land and its resources were carefully distributed between the separate clans”.²³ Orliac and Orliac agree with other academics, that the profound transformation of the Rapa Nui society occurred somewhere around 1680. Researchers place the outbreak of interclan wars around this time – based on the oral tradition, the proliferation of obsidian spearheads in this period, and the presence of human bones in settlement sites (also pointing to possible cannibalism). Also, in that period some *moai* were toppled – either purposefully in an

¹⁷ LIPO, Carl P. – HUNT, Terry L.: The ‘walking’ megalithic statues (*moai*) of Easter Island. In: *Journal of Archaeological Science*, Vol. 40, No. 6., June 2013, p. 2859-2866.

¹⁸ FISCHER, pp. 9-10.

¹⁹ CARDINALI, Sonia Haoa – INGERSOLL, Kathleen B. – INGERSOLL, Daniel W. – STEVENSON, Christopher M.: *Cultural and Environmental Change on Rapa Nui*. 2017. Accessed via Google Books on 22.10.2017. Pages not numbered.

²⁰ The authors claim this based on the analysis of the change in charcoal provenance in hearths, which indicates almost a hundred percent change from wood to stalks of grasses in the first half of the 17th century. CARDINALI et al.

²¹ CARDINALI et al.

²² PEISER, Benny. “From Genocide to Ecocide: The Rape of Rapa Nui”, p. 519.

²³ CARDINALI et al.



Center for Strategic and Defense Studies

CSDS Viewpoints 2018/5.

attempt to delegitimise foes' power over the land, or by the lack of care as the sculptors ceased their activity. Changes in religious ceremonies occurred as well: bones started to be deposited in funerary chambers, instead of previously practised cremation that required a lot of timber.²⁴ Violent conflict in such contexts is not a surprising outcome, as researchers from the Peace Research Institute Oslo and the University of Oslo, analysing modern armed conflicts, listed exactly the same factors (i.e. deforestation, land degradation, and scarce supply of freshwater, alone and in combination with high population density) as these “increase the risk of domestic armed conflict, especially low-level conflict.”²⁵

The cause of this societal instability may have been environmental, although not anthropogenic – as Orliac and Orliac point out. It was rather a serious individual weather-related event or a climate variability. Yet, the occurrence of the Little Ice Age in the same time period (the middle of the 17th century) and, in consequence, the lowering of the annual mean temperature by one or two degrees Celsius could not have had a serious impact on this island, deprived of any glacier. Thus, it was rather a serious and prolonged drought, brought about by the often catastrophic El Niño – Southern Oscillation²⁶ ocean current that caused massive fires, and consequently ravaged the flora, destroying *Triumfetta*. Without this plant, which is rich in fibrous material, production of ropes halted, rendering the construction of canoes and the erection of statues impossible.²⁷ This hypothesis does not exclude dual-causation possibility, as demographic pressure on the environment – presented in the first scenario (total eradication of the high woodland) –, might have made later devastation caused by the environment much easier, as the winds and drought had stronger impact on the deforested and eroded land surface.

The causes and course of the Easter Island's cultural and societal crisis remain debatable.²⁸ Yet most researchers agree on the rapid deforestation (whether anthropogenic or climate-induced), and a significant societal change and even violent conflict that followed, resulting in a significant decline in the population and the development of civilisation. Therefore, “Easter Island still seems to be a plausible model for Earth Island”,²⁹ as it reveals the complexity and fragility of the environment and its impact on people's lives, and “people see the collapse of Easter Island society as a metaphor, a worst-case scenario, for what may lie ahead of us in our own future.”³⁰

The population of Rapa Nui experienced an environmental change that significantly influenced the wellbeing of people and their lives, causing malnutrition and social change, migration and violent conflict, demographic and civilizational regression. As the island was isolated and its inhabitants could

²⁴ ORLIAC, Catherine – ORLIAC, Michel: The Disappearance of Easter Island's Forest: Over-exploitation or Climatic Catastrophe? *Journal of Economic Growth*, Vol. 132, January 1998, pp. 129-134.

²⁵ Hauge, WENCHE IREN – ELLINGSEN, Tanja: Beyond Environmental Scarcity: Causal Pathways to Conflict. *Journal of Peace Research*. Vol. 35., 1998/3., pp. 299–317.

²⁶ “One of the most important and mysterious elements in global climate is the periodic switching of the direction and intensity of ocean currents and winds in the Pacific. ... [El Niño – Southern Oscillation] phenomenon typically occurs every three to seven years. It may last from several months to more than a year. The 1997-1998 El Niño conditions were the strongest on record and caused droughts in the Southern U.S., in East Africa, Northern India, Northeast Brazil and Australia. In Indonesia, forest fires burned out of control in the very dry conditions. In California, parts of South America, Sri Lanka, and East-Central Africa, there were torrential rains and terrible floods.” MASLIN, Mark: *Climate Change. A Very Short Introduction*. Oxford University Press, Oxford, 2014. p. 88.

²⁷ ORLIAC – ORLIAC, p. 132.

²⁸ For following the academic and social media discussion, see: LYNAS, Mark: [The myths of Easter Island – Jared Diamond responds](#). *Environmental news and comment*. [online], 22 09 2011 Source: Marklynas.org [28 12 2017]

²⁹ FENLEY, John: New Data and new thoughts about Rapa Nui. In: STEPHENSON, Christopher M. – LEE, Georgia – MORIN, Francis J. (eds.): *Easter Island in Pacific Context*. The Easter Island Foundation, 1998. pp. 125–128, as quoted by PEISER, p. 514.

³⁰ DIAMOND, Jared: *Collapse: How Societies Choose to Fail or Survive*. Allan Lane, London, 2005. p. 119.



not abandon it (due to lack of material to construct canoes), it draws comparison with another isolated land, the inhabitants of which cannot leave in search for a better place to live – an isolated planet that is facing an environmental change.

Climate change, environment and human security in Africa

The isolated island of Rapa Nui was not the only case of a society touched by environmental change. Many other societies and states were much more heavily impacted by the changing natural environment due to the climate variability; and collapsed in consequence. These include among others the Akkadian (ca. 4200 years BP), Classic Maya (ca. 1200 years BP), Mochica (ca. 1500 years BP) and Tiwanaku (ca. 1000 years BP) empires.³¹ Various historical studies collected in the 2014 Intergovernmental Panel on Climate Change (IPCC) Report conclude that the period of the Little Ice Age witnessed more cases of political upheaval and warfare than any other time in Europe, in the territory of the Ottoman Empire and even in China. Thus, the authors state that “climate change can exacerbate major political changes given certain social conditions, including a predominance of subsistence producers, conflict over territory, and autocratic systems of government with limited power in peripheral regions”.³² Regardless of the fact that all these studies, findings, and conclusions cannot be “copy-pasted” into our modern world’s reality, they exemplify that climate can have an impact on people’s wellbeing and the stability of states.³³

Despite the technological breakthrough that occurred in the last two hundred years, or perhaps due to it, the phenomenon is not only historical. In his highly resonating article published in 1994³⁴ (and developed into a collection of essays in 2000), Robert Kaplan envisaged the future of the world affected by environmental degradation, diseases, erosion of nation-states and international borders, social disarray, and ravaging crime, providing a vision of turbulent and imminent reality that is to affect every part of the world. In his narration (that is perhaps too pessimistic and deterministic – his critics claimed) Kaplan recognised the environment as “the national security issue of the early twenty-first century.”³⁵ Furthermore, he warned that “surging populations, spreading disease, deforestation and soil erosion, water depletion, air pollution, and, possibly, raising sea levels in critical, overcrowded regions (...) will prompt mass migrations and, in turn, incite group conflicts.”³⁶ As his case study and exemplification of the future world, Kaplan, not surprisingly, chose West Africa. In his forecast Sierra Leone, Liberia and even the “successful” Côte d’Ivoire or the oil-rich Nigeria have been ravaged by internal tensions and violent conflicts. The demographic pressure of overpopulation, accumulating mostly in shanty towns, is rising every year, as environmental degradation follows, and the ruling political elite seems more detached and predatory as ever.³⁷ Such situation is unsupportable for a prolonged period of time and the recent migration crisis,³⁸ observed in Europe and North Africa, seems to exemplify the first stage of the spill-over effect.

³¹ BP refers to “before present”, i.e. before 1950 A.D., when the radiocarbon dating measurement became popular. See: DEMENOCAL, Peter B.: Cultural Responses to Climate Change During the Late Holocene. *Science*, Vol. 292, No. 5517 (27 April 2001), pp. 667-673.

³² Intergovernmental Panel on Climate Change: *The Fifth Assessment Report. Climate Change 2014: Impacts, Adaptation, and Vulnerability*. Chapter 12: Human Security. [online], 2014. Source: IPCC.ch [21 11 2017], p. 772.

³³ Ibid.

³⁴ KAPLAN, Robert: *The Coming Anarchy*. [online], February 1992. Source: The Atlantic, [20 10 2017]

³⁵ KAPLAN, Robert: *The Coming Anarchy: Shattering the Dreams of the Post Cold War*. Random House, New York, 2000. pp. 19-20.

³⁶ KAPLAN, *The Coming Anarchy: Shattering the Dreams of the Post Cold War*, p. 20.

³⁷ KAPLAN, *The Coming Anarchy*

³⁸ A crisis evokes a temporary situation, while the phenomenon of mass migration seems to remain, and become a constant part of the reality; nonetheless in the current academic discourse the notion of “crisis”, in reference to migration, dominates.



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CSDS Viewpoints 2018/5.

Were it not enough, climate change exacerbates humans' pressure on the environment, and climate change happens: “[w]arming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased” – as highlighted in the Summary for Policymakers of the 2013 IPCC Report.³⁹ Mark Maslin explains the IPCC report findings, providing more details: over the past hundred years, the temperature rose by 0.8°C, and the sea level by 22 centimetres. Depending on the course of the phenomenon of the global warming and the way it is (or is not) controlled, the global temperature may rise by 2.8–5.4°C, and the sea level by 52-98 centimetres until the end of the present century. These increases will be accompanied with “significant changes in weather patterns with more extreme climate events”, thus creating not only warmer but harsher and less predictable climate conditions, to which accommodation will be more difficult.⁴⁰

Maslin presents the international consensus that sets the acceptable border limit of temperature increase at +2°C comparing to pre-industrial average temperature. Admitting that it is a *political* and symbolic number, he explains that it allows understanding the nature of the forthcoming changes. Within the limit of the “preindustrial +2°C”, there are both losers and winners due to regional climate change variations, yet temperatures rising above the limit cause everybody on the planet to be a victim of climate change. The dramatic outcomes (that can occur if global temperatures rise beyond the “preindustrial +2°C” limit) in water shortage, starvation, flooding and malaria proliferation is depicted on Figure 1. below. It shows that hundreds of millions more people will be affected. If global temperatures rise by 3–4°C, extreme weather events will become over ten times more common than in 2010. We will face major species extinction, environment-forced mass migration, and conflicts over resources. Reaching the level of +4°C to +5°C will mean that a fifth of world population will be affected by flooding, three billion people will lack water, and the food production will fall dramatically, leading to wide-spread starvation. The resulting global death rate is hard to predict, though it does not seem an exaggeration to assess it as apocalyptic.⁴¹

It is worth noting that, by now, the temperature has already increased by 0.8°C, so the humanity is on the way to reach the dangerous threshold. Furthermore, “because of the inertia in the climate system, by 2035 we already expect a further increase of 0.3–0.7°C. So, without doing anything, we will be up to 1.1–1.5°C by 2035” – Maslin warns.⁴² Tackling global warming now would cost between two to three percent of the world's Gross Domestic Product (GDP), but doing it in the middle of the century rises this cost up to twenty percent of the world's GDP – the British scientist adds.⁴³

³⁹ Intergovernmental Panel on Climate Change: *The Fifth Assessment Report. Climate Change 2013: The Physical Science Basis Summary for Policymakers*. [online], 2014. Source: IPCC.ch [21 11 2017], p. 4.

⁴⁰ MASLIN, p. XVII.

⁴¹ MASLIN, pp. 95-96.

⁴² MASLIN, p. 69.

⁴³ MASLIN, p. XVIII.

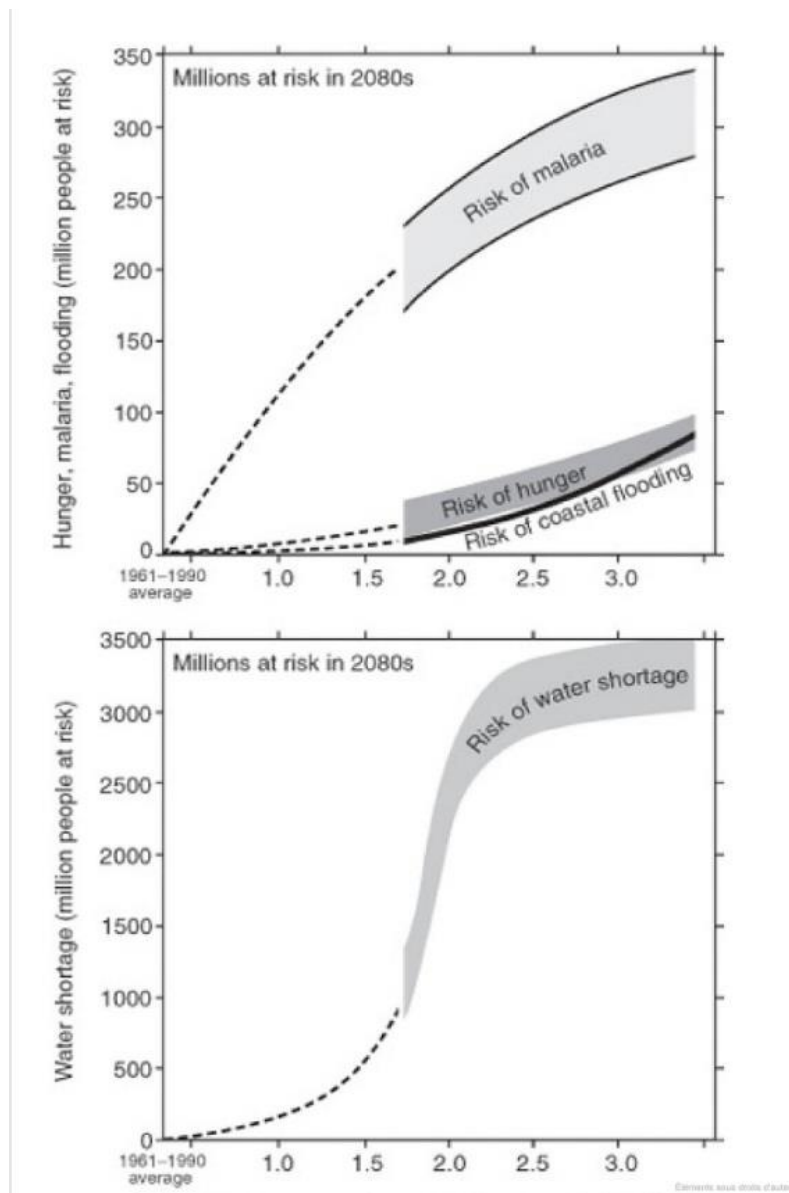


Figure 1: Climate change risks as a function of increasing global temperatures. The limit of +2°C is both a political and a symbolic number, as beyond that point the number of people affected by 2080 will increase radically, leading to dramatic outcomes. (Source: MASLIN, p. 70.)

Presented climate change outcomes – according to Oli Brown and Robert McLeman – may be classified into five categories or ways, in which climate change impacts security by undermining peace and stability. Firstly, it creates volatile weather patterns that reshapes the landscape, deregulates and decreases food production, limits access to fresh water and exacerbates energy scarcity. Secondly, climate change increases the frequency and intensity of natural disasters, coupled with diseases that follow, like cholera or malaria – it overstretches the coping-range of affected societies, especially in the countries of the Global South. Thirdly, rising sea levels and permanent desertification deprive people of their habitation, including entire low-lying countries. Fourthly, the receding ice cap opens access to new maritime routes and previously inaccessible resources, contributing to interstate tensions. Last, but not least, by combining the outcomes of the changed productive landscape, exacerbated by natural disasters, climate change effects may trigger people’s local movements, regional displacements



Center for Strategic and Defense Studies

CSDS Viewpoints 2018/5.

and transnational migrations (creating so called ‘climate refugees’), and in consequence, violent competition over land and access to its resources.⁴⁴

The most vulnerable and the least resilient societies to outcomes of environmental change inhabits the Global South, including inter alia Africa, where “[c]limate change and climate variability have the potential to exacerbate or multiply existing threats to human security, including food, health, and economic insecurity”⁴⁵ – the IPCC report states in its chapter devoted to Africa. These factors are uncontested drivers of armed conflicts on the continent, and, although it is hard to establish a causal relation between climate change and violent conflict (due to the multiplicity and interconnectedness of the factors involved), climate change is considered an important exacerbating variable.⁴⁶ Brown and McLeman agree with the above stated limitations, saying that “the picture is nuanced and the relationships are not necessarily linear.”⁴⁷ The multiplicity of causes and the exacerbating role of climate change is also underlined by the researchers of the Internal Displacement Monitoring Centre (IDMC), whose *Africa Report on Internal Displacement 2016* affirms that “[c]limate change, in tandem with drivers of people’s increasing exposure and vulnerability, is expected to heighten the risk of displacement globally in the coming years and decades as extreme weather events become more frequent and intense.”⁴⁸

The methodological difficulty in researching the relation between climate change and violent conflicts is not limited solely to the usual existence of multiple overlapping drivers of conflicts. Climate change, understood as a permanent (long-term, measured in decades) change in the climate system should be differentiated from climate variability, that encompasses reversible short-term events, and these are different from individual weather events. Thus, there is a challenge in recognising weather and climatic anomalies as climate change, which falsifies the real effects of climate change. The second challenge is posed by the temporal dimension. While it is quite easy to assess the immediate effects of rapid-onset disasters (e.g. torrential rain and flooding), it poses quite a challenge to assess the results of slow-onset disasters (e.g. droughts),⁴⁹ which have a delayed impact on the environment, and thus their effects may be confused with those resulting from other factors. Then, there is the spatial dimension, sometimes misleading, when data for a given geographical area remains stable, while concealing real change occurring in sub-regions, like overall rainfall in a given country remains unchanged, while it significantly differs within the regions, increasing in one, and decreasing in another. Furthermore, researchers face inconsistencies in the applied definitions and different

⁴⁴ BROWN, Oli – MCLEMAN, Robert: A recurring anarchy? The emergence of climate change as a threat to international peace and security. *Conflict, Security & Development*. Vol. 9, 2009/3., pp. 290-305, p. 293.

⁴⁵ Intergovernmental Panel on Climate Change: *The Fifth Assessment Report...*, Chapter 22: Africa. [online], 2014. Source: IPCC.ch [21 11 2017], p. 1204

⁴⁶ Intergovernmental Panel on Climate Change: *The Fifth Assessment Report...*, Chapter 22: Africa, p. 1239.

⁴⁷ BROWN – MCLEMAN, p. 300.

⁴⁸ Internal Displacement Monitoring Centre: *Africa Report on Internal Displacement 2016*. [online], December 2016. Source: Internal-displacement.org [21 11 2017], p. 11.

Here, it should be noted that a successful attempt to collect, analyse and overview the literature and its findings on climate change and violent conflict in East Africa has recently (2016) been realised by Sebastian van Baalen and Malin Mobjörk from the University of Stockholm and the Stockholm International Peace Research Institute, whose report is broadly quoted farther in this text. For the reason of completed and very recent character of the work done by the Swedish researchers, the author of this article does not attempt to redundantly repeat the effort.

⁴⁹ Droughts can be classified as a meteorological, agricultural, hydrological or environmental event (which combines all aforementioned cases), what implies different approaches to researching their causes and impact. Internal Displacement Monitoring Centre: *Africa Report on Internal Displacement 2016*., p. 19.



Center for Strategic and Defense Studies

CSDS Viewpoints 2018/5.

methodologies, unreported cases, limited access to certain areas, manipulation of data for political purposes, etc.⁵⁰

The ongoing genocidal conflict in Darfur (Sudan), that has been dubbed with some exaggerations ‘the first climate war’,⁵¹ serves as a good example of the multiplicity of drivers, including a climate variable, that stand behind the contemporary African armed conflict. It would be an oversimplification to blame its outbreak solely or even primarily on climate change, though the climate-related factors are vividly visible as significant underlying causes of the violence. Besides the environmental phenomena (such as droughts, soil erosion, desertification), overpopulation and growing herds, researchers also enumerated political factors contributing to the outbreak of violence, such as “the legacy of past [inter-group] violence, manipulation of ethnic divisions by elites in Khartoum, weakening of traditional conflict resolution mechanisms through government policies and as a consequence of famines; systematic exclusion of local groups from political processes, including of the Fur, Masalit, and Zaghawa ethnic groups; limited economic development and inadequate provision of public services and social protection, stemming from governance and policy failures, political instability, and misuse of official development assistance.”⁵² Most authors consider these political factors more instrumental than the environmental ones.⁵³ Although, as Harald Welzer claims, the history of violence in this country, at least since the famine of 1984, “has been closely bound up with ecological problems.”⁵⁴ However, the violence would not materialise at such scale and with such brutality, had there not been the will and purposeful action of the government of Omar al-Bashir, wanted by the International Criminal Court for crimes against humanity, war crimes and genocide.

Examining the East African cases, van Baalen and Mobjörk observed an indirect, yet continuous and contiguous relation between climate change and violence. According to the authors, climate change and variability worsen livelihood conditions, what may increase migration and change pastoral mobility patterns, increase armed group recruitment, and increase the risk of violent resource competition, leading to the outbreak of violence. Climate-related environmental change also affects the dynamics of existing tensions and conflicts by elite exploitation of local grievances or the tactical considerations of armed groups (see Figure 2.).⁵⁵

⁵⁰ VAN BAALEN, Sebastian – MOBJÖRK, Malin. *A coming anarchy? Pathways from climate change to violent conflict in East Africa*. Stockholm University Press, Stockholm, 2016, pp. 7-9 and 33-37; Internal Displacement Monitoring Centre: *Africa Report on Internal Displacement 2016.*, pp. 25-26.

⁵¹ WELZER, Harald. *Climate Wars: What People Will Kill for in the 21st Century*. Polity Press, Cambridge, 2012, pp. 61-65.

⁵² Intergovernmental Panel on Climate Change: *The Fifth Assessment Report...*, Chapter 12: Human Security. [online], 2014. Source: IPCC.ch [21 11 2017], p. 773.

⁵³ Ibid.

⁵⁴ WELZER, p. 62.

⁵⁵ VAN BAALEN – MOBJÖRK, p. 19.

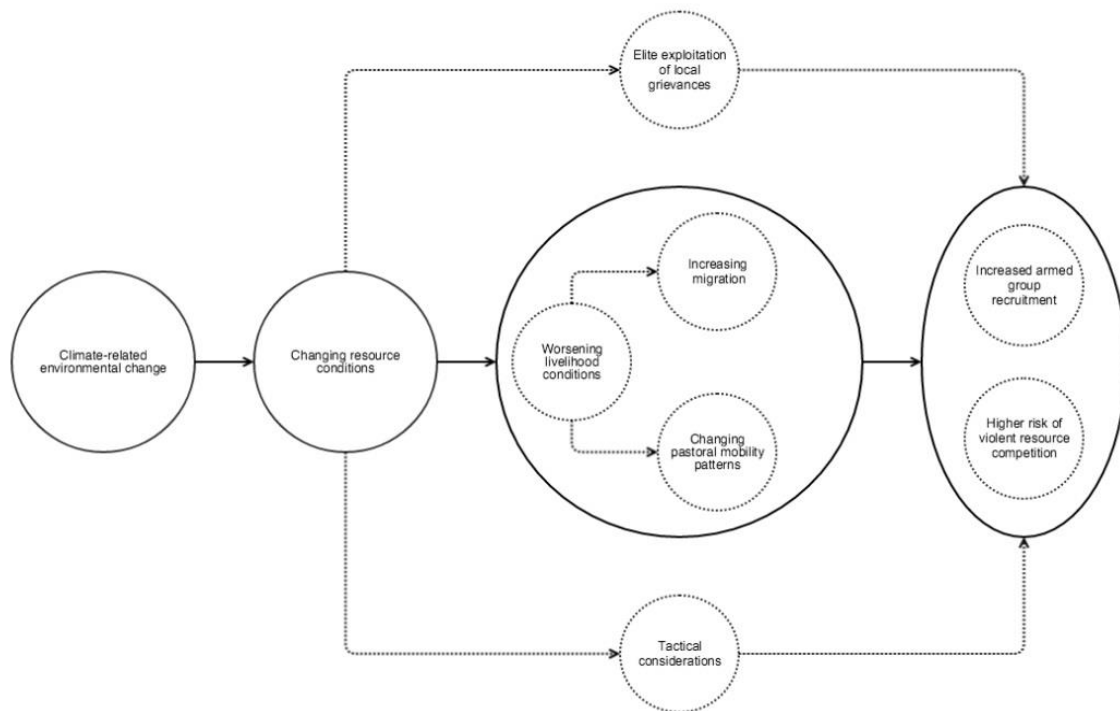


Figure 2: Pathways from climate-related environmental change to increased risk of violent conflict in East Africa.⁵⁶ (Source: VAN BAALEN – MOBJÖRK, p. 19.)

The researchers found that unfavourable weather conditions heighten the risk of conflict and exacerbate its consequences, including displacement. For example, extremely hot weather increases the risk of violent conflicts (due to lower crop yields and higher livestock losses), or as one can observe the particular case of Tanzania, brings about a rise in witch-killing. Rapid on-set disasters (e.g. flooding) are more prone to cause conflict than the slow-onset ones (as people have less time to adapt), while changing pastoral mobility patterns are found to be one of the most frequent causes of violence. Wet seasons witness violence related to livestock-raiding (it is a tactical consideration, as during the rain it is easier to hide and feed the livestock). The occurrence of violence is more plausible between different ethnic groups (as the exploitation of identity, easier mobilisation, and lack of traditional conflict resolution institutions play an important role in this case), and in places with a history of conflict. Violence itself is an outcome of decreasing opportunity costs (somehow a rational choice, when an actor has nothing to lose) which may be, partially or fully, caused by the environmental factors. Therefore, the climate-related environmental changes can exacerbate violence by decreasing vulnerable people’s livelihood conditions (and thus the opportunity cost). However, climate change and variability are rather the causes of tensions or low-intensity conflict and small-scale violence. Yet – the authors stipulate – human behaviour cannot be explained solely by the climate with overlooking the cultural and political factors of violence. Therefore, climate change is rather a non-deterministic driver of violent conflicts in East Africa, not a trigger. “Thus, while climate-related environmental change in itself has not precipitated an East African anarchy so far, it has already played a role in the

⁵⁶ “Filled arrows indicate that climate-related environmental change increases the risk of violent conflict, whereas dotted arrows indicate that climate-related environmental change affects the dynamics of existing violent conflicts. The diagram is a result of the empirical analysis...” VAN BAALEN – MOBJÖRK, p. 19.



Center for Strategic and Defense Studies CSDS Viewpoints 2018/5.

dynamics of violent conflict and will probably continue to do so, even though the consequences are ultimately mediated by human behaviour” – van Baalen and Mobjörk summarise.⁵⁷

The environment we are living in is significantly changing and the change is imminent. The anthropogenic climate-related environmental changes cause tensions among peoples and exacerbate violent conflicts. One of East Africa’s worst tragedies in recent history, the genocide in Darfur, illustrates how conflict, growing on a degrading environment, can drastically escalate when brutally and mercilessly exploited by political elites. With progressing global warming and rising demographic pressure, the conditions on the African continent will become harsher, desertification and deforestation will progress, soil erosion will follow, agriculture crops diminish, and thus the conflict potential will increase.

Thriving in a collapsing setting, like the island-dwellers of Rapa Nui, we cannot undo the process, neither instantly halt it, nor leave the land we depleted. Limitation, mitigation, adaptation and resilience are the only solutions left to apply. Although reducing the extent and effects of climate change is primarily the responsibility of the most powerful states, the burden of coping with the gravest outcomes falls mostly on the weak and vulnerable societies of the Global South. While they should be particularly assisted in mitigation, every society on the planet should build or improve its resilience and adaptation mechanisms to forthcoming changes. Presently observed north-bound migration is just a first act, and an initial stage of greater global changes yet to happen, if anthropogenic phenomena such as deforestation, air pollution and general environmental degradation will not be limited in time. Whether the anarchy is coming, depends solely on us – the inhabitants of this isolated land.

⁵⁷ VAN BAALEN – MOBJÖRK, pp. 17-32.



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Edited by:
Tamás Csiki Varga

Contact:

1581 Budapest, P.O. Box. 15.

Phone: 00 36 1 432-90-92

E-mail: svkk@uni-nke.hu

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