

Congo Basin and Planet Sustainability: A Novel Approach

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Abstract

This paper compares ways of life in the Congo Basin to uranium pellets stacked together into fuel rods, whose fission generates immense heat that turns water into steam to spin a turbine that generates electricity. In other words, people's ways of life in the Congo Basin can generate powerful sustainability means to improve local living conditions and protect local living environment. Protecting Congo Basin environment will result in planet sustainability. It is suggested in this paper that world resources for fighting climate change be used to stimulate ways of life in the Congo Basin to become powerful D. sustainability means for the planet. Currently, most resources to combat climate change are spent in developed countries, while ways of life in the Congo Basin as means for planet sustainability are ignored. No wonder why, to date, efforts to fight climate change bear little to no good result. This paper suggests a novel approach that urges the world to focus on ensuring that ways of life in the Congo Basin translate into means that improve local living conditions and protect local rainforest that sustains the global environment.

The Congo Basin

The Congo Basin stands as the world's second-largest tropical forest, alongside the Amazon. Its rainforest is estimated at 2 million square kilometers (8 hundred thousand square miles). When including secondary and savanna forest, the area equals about 3 million square kilometers (1.2 million square miles).

The Congo Basin is defined by the watershed of the Congo River, located primarily in the Democratic Republic of Congo, with smaller portions in Gabon, Republic of Congo, Cameroon, Central African Republic, and Equatorial Guinea.

The Congo Basin is made of a mosaic of rivers, forests, savannas, swamps, and flooded forests. The area contains approximately 10 thousand species of tropical plants, of which 30 percent are unique to the region. Endangered wildlife, including forest elephants, chimpanzees, bonobos, and lowland and mountain gorillas inhabit the lush forests. Additionally, four hundred other species of mammals, one thousand species of birds and seven hundred species of fish are found there.

The Congo Basin has been inhabited by humans for more than 50 thousand years and it provides food, fresh water, and shelter to about 70 million people, not counting people who live in cities and urban areas.

Endangered Congo Basin

The Congo Basin deforestation is steadily rising due to small-scale and large-scale activities taking place in the region. Studies are finding that at current trends, all primary rainforest in the Congo Basin could be cleared by the end of the century. Activities driving the rapid disappearance of the Congo Basin's tropical forest include, among others, artisanal or small-scale agriculture, logging, and mining on one hand, and industrial or large-scale agriculture, logging, and mining on the other hand.

Artisanal agriculture

This small-scale agriculture is done by indigenous people for their subsistence. It is also known as slash and burn farming, a form of

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shifting agriculture where the natural vegetation is cut down and burned as a method of clearing the land for cultivation, and then, when the plot becomes infertile, the farmer moves to a new fresh forest and does the same thing again. When practiced by millions of farmers, the rainforest gets destroyed rapidly.

In addition to progressive deforestation, slow regrowth of the forest, and lack of restoration of soil fertility, there are other problems that arise when the plots are far from the dwelling place. These other problems include cash crops that cannot be guarded from thieves or wild animals, and the fact that families cannot go far away when they have young children in their care. While deforestation jeopardizes climate stability, the other host of problems ensure the farmers remain poor. Hence, young farmers are often forced to abandon the land, and migrate to city slums in the hope of making better life for themselves and their families. But in the slums, there is not enough work available, and the migrants and their families find themselves in yet worst hardships and living conditions, where they often get stuck for the rest of their lives.

Artisanal logging

This small-scale logging is done for two main reasons: housing and fuel. Populations in the Congo Basin forest use threes and leaves as building materials. This is particularly destructive because such houses are short-lived, requiring a repetitive harvesting of threes and leaves needed for renovations every 5-10 years, in addition to building new houses. Trees are also used as fuel for cooking and warming. The trees are cut, kept under the sun to dry, and then burned directly to cook. Another technique consists of burning the dry wood into charcoals to be then used for cooking. When this type of small-scale logging is practiced by millions of people, then the deforestation result becomes noticeable.

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Artisanal mining

An artisanal mine is an informal operation, exploiting a mineral in an unplanned manner, using mostly manual methods and rudimentary tools/machinery. At artisanal or small-scale level, miners may operate individually using pick-axes, shovels, and pans to access and process alluvial deposits. Semi-mechanized operations may use a variety of mechanized tools and equipment to complement the manual labor force. This work requires clearing the area for extraction, which leads to deforestation as well. And when artisanal mining is practiced by millions of people, then it too builds a noticeable deforestation effect.

Industrial scale agriculture

Here, hundreds of square kilometers/miles of rainforest are bulldozed for farming. This is an intensive agriculture that is also characterized by an increased usage of chemical fertilizers, irrigation systems, pesticides, and mechanized technologies to increase agricultural productivity. The Congo Basin is dominated by small-scale agriculture, but the practice of large-scale agriculture for crops like rice, maize, and banana is increasing. Industrial agriculture is practiced by foreign corporations that obtain farming licenses from local land management administration agencies. The licensing process often involves corruptions and disregard for local populations that are easily dispossessed and pushed out of their land concessions in favor of foreign corporations for large-scale farming.

Industrial scale logging

In the Congo Basin, industrial logging concessions cover about 60 million hectares (600 thousand square kilometers or 232 thousand square miles) of forest. Countries of the Congo Basin have most of their forest land governed by some form of forest management. But illegal logging is prevalent. Illegal logging comes in many forms, such as logging in protected areas, logging in established concessions but of prohibited species, or logging in established areas of legal species but more than the allowable cut. Illegal logging has contributed to conflicts with indigenous and local populations, violence, human rights abuses, corruption, funding of armed conflicts and the worsening of poverty.

Studies have shown that the environmental effects of industrial logging include deforestation, the loss of biodiversity and the emission of greenhouse gases.

Industrial scale mining

Currently, most of the large-scale mining operations in the Congo Basin occur in non-forested areas. This is because these mining operations were established in the early nineties during colonial rules, and the areas since urbanized. However, as mining explorations and development increase in the equatorial forest region, so too the mining impact on the forest is increasing. Impacts of mining operations on forests occur at different stages of the operations (exploration, exploitation, and closure) and can be direct, indirect, and cumulative.

The stages of exploration and exploitation include the following activities: site preparation, clearing and initial preparation for mining, construction of accommodations, construction of process and site facilities (for example, mills, and offices), building roads and airstrips (installation of power lines and railway).

Mine site construction and ore extraction require vegetation and topsoil removal. Land clearing for site construction and mineral

excavation increases the potential for significant soil erosion and sedimentation. If topsoils are not set aside and conserved for the reclamation phase, restoration of the forest ecosystem will be difficult, if not impossible. Soils that are not conserved can be washed away into nearby rivers, streams, lacs, ocean shore, etc., causing sedimentation that can destroy aquatic habitat and result in a decline in fish species. Primary processing generally occurs at the mine site and consists of chemical, electric, or physical methods to separate the mineral from the ore body. The main concern at the processing stage is chemical and waste management.

Small-scale operations often discharge processing waste directly onto the ground or into waterways. Large-scale operations process high volumes of ore in a facility that might use significant quantities of water and energy. Effluents are typically discharged into artificially created holding ponds known as tailings impoundments. The effluent might contain trace amounts of mercury, cyanide, the target mineral, and other processing reagents. Disruptions in water cycles and water quality can lead to forest degradation, with changes in species composition and structure, and loss of biodiversity.

Mine closure and site rehabilitation take place after all economically viable minerals have been extracted. In large, well-run operations, planning for site rehabilitation often occurs during the exploration phase. Closure and site rehabilitation typically involve capping waste rock dumps to prevent acid mine drainage and other toxic effluents, replacing topsoils, recontouring the landscape, and revegetation. The site should be returned to a state that is deemed useful for the region's population, if not equivalent to the original landscape. But because of corruptions that dominate administrations in the Congo Basin countries, closure and site rehabilitation are often given short shrift; and in worse cases, little or no rehabilitation are conducted.

Studies have found that in many if not most cases, mines in the Congo Basin are poorly run, do not follow international best practices, and have significant direct, indirect, and cumulative negative impact on forests.

Dwindling Congo Basin Jeopardizes Planet Sustainability

For too long, valuable trees have been chaotically and illegally cut for timber and exported for products like furniture and flooring. Currently, timber cut in the Congo Basin is being sent around the world, including the European Union member states, the United States, and increasingly to China. This is leading to deforestation, destruction of wildlife habitat, conflicts and strife, damages to local communities, and diminished resilience to climate change.

The Congo Basin and the Amazon are the world's two largest remaining areas of tropical rainforests, that store more than 200 billion tons of carbon. Because they represent a large expanse of continuous forest, the Congo Basin and the Amazon exert regional and global influence on world climatic and rainfall patterns. Therefore, protecting and saving the rainforests of the Congo Basin and the Amazon is crucial for planet sustainability.

Calls for Action

Climate-related international conferences arose out of concerns for the decline of planet sustainability. To mention a few, let us start with the November 1962 conference, where member states of the World Meteorological Organization (WMO) met at Noumea, New Caledonia,

and discussed issues related to meteorological observations, tropical cyclones, weather and climate services, and information management. Ten years later, in June of 1972, the United Nations (UN) Conference on Human Environment was convened at Stockholm, Sweden. This was the first major international conference on environmental issues, and marked the beginning of public concern for, and political awareness of, global environmental problems. One of the most important results of the UN Conference on the Human Environment was the creation of the UN Environment Programme (UNEP). In August of 1977, the UN Conference on Desertification was held in Nairobi, Kenya. The conference produced the Plan of Action to Combat Desertification, which consisted of guidelines and recommendations to help individual countries develop their own action plans and to coordinate assistance from the international community.

The 4th Session of the IPCC (Intergovernmental Panel on Climate Change) was held in Sundsvall, Sweden, in August of 1990. The conference specifically discussed greenhouse gases, global warming, and climate change. It was there that the IPCC First Assessment Report was adopted. This report would serve as the basis for the UN Framework Convention on Climate Change (UNFCCC), an international environmental treaty established at the 1992 Rio Summit, also known as Earth Summit 1992 or UN Conference on Environment and Development (UNCED). In 1997, in Kyoto, Japan, the Kyoto Protocol for greenhouse gases was adopted at Kyoto Climate Change Conference, at which most industrialized nations agreed to legally binding reductions in greenhouse gas emissions of 6-8% below 1990 levels by the years 2008-2012.

The 2015 UN Climate Change Conference was held in Paris, France. The conference benefited from extensive preparatory work, and increasing international social conscience about man-made global warming (e.g. the US-China November 2014 agreement on climate change, the May 2015 encyclical letter of Pope Francis on Environment, "Laudato Si"). About 195 countries signed an agreement (also known as Paris Climate Agreement/Accord) that laid the foundation for international cooperation to fight global warming, including a goal of no more than a 2°C global temperature increase, mechanisms for mobilizing climate finance and embedding international climate legislation into national action, and differentiation between the responsibilities of developed and developing countries.

As noted in his June 1, 2017 remarks, President Donald Trump made the decision to withdraw the United States of America from the Paris Agreement because of the unfair economic burden imposed on American workers, businesses, and taxpayers by U.S. pledges made under the Agreement. On December 12, 2020, U.S. President-elect Joe Biden pledged to re-join the Paris Climate Accord on the first day of his presidency.

Fighting Climate Change

Resources

In 2009, at a UN summit in Copenhagen, wealthy countries resisted calls to directly compensate poorer nations that are harmed by their carbon emissions, but agreed to channel \$100 billion a year, starting in 2020, to developing countries to help curb their carbon footprint and cope with future climate impacts. As for today, the pledge is not met.

The Climate Policy Initiative (CPI), an international thinktank that publishes annual analyses, says that total climate-related financing was \$510 billion to \$530 billion in 2017, up from \$360 billion in 2012.

How are the resources spent?

The resources to fight climate change are being heavily spent on fossil-fuel projects. In 2018, fossil-fuel subsidies totaled more than \$400 billion, according to the International Energy Agency. The International Monetary Fund has tried to calculate the hidden costs associated with continuing to burn oil, coal, and gas - such as air pollution and global warming - and estimated that the unpaid damages caused by fossil fuels could amount to \$5.2 trillion in 2017 alone.

Secondarily, the money is spent by private investors in wealthy nations on projects such as solar plants. Funding is not backing the would be game-changing projects in the Congo Basin. Overall, renewable-energy systems, energy-efficiency projects and sustainable transport take the lion's share of climate financing, and most of these projects take place in developed nations.

Agriculture, forest and land-related initiatives struggle for funding - receiving just \$9 billion in 2016, according to the CPI - even though this sector was responsible for almost one-quarter of the past decade's deforestation, according to the Intergovernmental Panel on Climate Change (IPCC)'s report on land use.

Studies show that much of the money does not go to the real battlefield: the Congo Basin and the Amazon. Energy experts say that the gap points to wider difficulties in refocusing financial systems towards a zero-carbon world, while too much money is still being spent supporting fossil fuels and other sources of greenhouse-gas emissions projects.

Poor result

The World Meteorological Organization estimates a 24% chance of surpassing the threshold of 1.5°C of warming in the next five years. The 2020 UNEP Emissions Gap Report concluded that the world remains on track to exceeding 3°C of warming by the end of the century. The IPCC has warned that emission cuts of 40%-60% from 2010 levels are needed by 2030 to stay on track to limit warming to the Paris Agreement's lower threshold of 1.5°C.

At the November 2020 Climate Dialogues, Intergovernmental Panel on Climate Change scientists were clear: immediate and urgent decarbonization is necessary and any delay adds to the burden on future generations.

Refocusing Climate Change Fight

Transformative projects in the Congo Basin

The climate change fight will be won only from bottom up, and not the opposite. The bottom is the Congo Basin and the Amazon where deforestation is taking place. Destructive agriculture, logging and mining that threaten planet sustainability take place in the Congo Basin and the Amazon. People living in the Congo Basin and the Amazon are the ones surviving small-scale and large-scale agriculture, logging, and mining. They are therefore the ones that must become actors and agents of change, fighters against deforestation, and stewards of planet sustainability. That is a novel approach, a new paradigm, to imagine and develop.

Therefore, funds and resources for fighting climate change must be understood as funds and resources to raise an army of actors and

agents of change, fighters against deforestation, and stewards of planet sustainability in the Congo Basin and the Amazon.

Empowering local populations

Funds and resources for fight against climate change should be used to empower local populations to develop simple, practical and smart techniques that are efficient for sustainable agriculture, construction and transportation, thus improving living conditions by reducing poverty, and in the process protecting the vitality of the environment.

It is not enough to simply distribute fertilizers to rural farmers for one season, construct/pave a road, install a water pump, build a library, build a school, build a clinic, etc. All this has been easily accomplished in the short run through charity works. More often than not, the quality and level of these services steadily diminishes because the people in the rural communities were not trained to create and sustain these services using local resources, nor did these services meet their priorities or lead to self-empowerment for durable outcome.

The local populations must be engaged to reinforce their priorities, to use local means and resources to develop products and services that meet their needs and protect their land, forest, waters and air, and lead to self-empowerment for durable and sustained economic growth.

Funds and resources to fight climate change must be used in the Congo Basin and the Amazon to help implement and reinforce environmentally sound development programs in existing rural schools and community colleges to pursue sustainable agriculture, develop clean water and sanitation, renewable energy, pollution free transportation of goods and people, through simple and pragmatic transmission and communication of knowledge and information that use local resources.

Vibrant local communities of producers and consumers that care for their land, forest, water, and air become actors and agents of change, fighters against deforestation, and stewards of planet sustainability.

An Example of Transformational Action-plan

This action-plan is intended to transform rural technical schools and community colleges in the Congo Basin into creative centers for sustainable development. Graduates of the programs will develop and possess the necessary skills to meet the need and demand for resource development and management, environmental protection, environmental assessment, water management, waste management, environmental research, and environmental education. They will develop innovative solutions and build their capacity for partnerships at the local, national, and international levels. They will become stewards of their environment and of a sustainable development in the Congo Basin.

Below are typical programs that can be developed and implemented in rural schools and colleges in the Congo Basin, to stimulate young minds to creatively imagine how to use local resources to develop transformational methods and techniques applicable to local realities, for the improvement of the local living conditions and for the protection of the local environment. This will trigger an unstoppable movement of sustainable development in the battlefield where the real fight to stop climate change must take place, and where the moneys and the resources should be spent to win the fight.

Construction

1. Design and build for local climate
2. Inventory and characterization of local construction materials
3. Smart logging for construction materials
4. Smart use of natural resources for construction purposes

Mechanical

1. Inventory, characterization and development of local technologies to improve on the environment
2. Inventory of local renewable energy resources
3. Development of simple and pragmatic techniques for converting renewable energy to heat and electricity

Industrial

1. Inventory, characterization and development of efficient local foundries and fabrication processes
2. Development of efficient local agricultural techniques, technologies and practices
3. Development of assessment techniques of impact of fabrications/productions on the environment (land, forest, water and air)

Fostering creative and sustainable development

1. Integrate livestock, crop, energy productions, and aquaculture
2. Develop and produce efficient tools of work from local resources (using basic clean and sustainable technologies)
3. Develop and utilize renewable energy from local resources
4. Emphasize entrepreneurial training where students are motivated to graduate with an environmentally friendly business project of their own to implement
5. Foster alumni networking and pro-environment actions

Conclusion

The new paradigm, the novel approach, calls for focusing on local populations and young people in the Congo Basin to become actors and agents of change, fighters against deforestation, and stewards of planet sustainability. In other words, local people are to transform their ways of life into means for sustainability that improve local living conditions and protect local living environment. Then they will guide how to apply and implement international, regional, and national summits and policies, and how to work with private for-profit and not-for-profit advocacy organizations to achieve desired result. Then, planting trees, recycling, reforestation, research that includes satellite imaging and global monitoring, incentivizing green development and industry, will become more effective because done in coordination with local people's imagination and creativity. Otherwise, millions of dollars will continue to be wasted in wrong climate change fights, while deforestation and global warming will continue, and planet sustainability will be jeopardized.

Competing Interests

The author declare that there is no competing interests regarding the publication of this article.

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