

Climate Change Mitigation and Adaptation: Progress, Production, and Destruction by Courtney Work

Summary:

Adaptation drives evolution and climate change poses significant challenges for unadaptable species. Despite this well-known fact, climate change mitigation and adaptation policies are explicitly pointed toward the same practices shown to cause climate instability. This research emerges at the intersection of studies in religion, spirits, and states in Southeast Asia and more recent investigations into land use and climate change mitigation and adaptation policies. My findings show 2 important things. First, ineffective climate change mitigation and adaptation policies are grounded in particular visions of progress and are supported by a deep belief in human exceptionalism. Second, these ideas can be traced to origin stories from the planet's major civilizations, which make them both widespread and cultural. Culture is a human creation. This observation can pave the way for new thinking about what it means to be civilized in the world and ignite solutions for real human adaptation to the coming crisis.

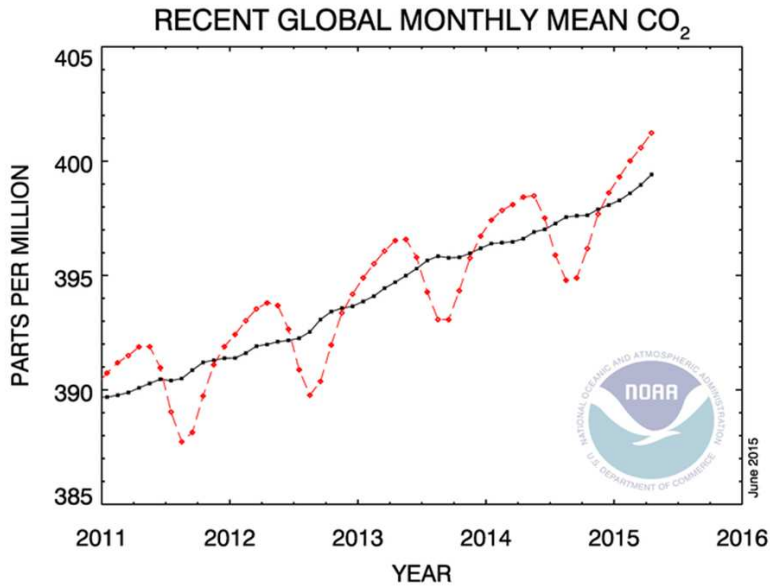
We have irrefutable evidence that climate instability is a product of human development and population growth. Additionally, research shows that climate change mitigation and adaptation policies entail carbon intensive inputs and infrastructures (Timilsina and Mevel, 2013; Mulvaney 2014; Zhang and Xu 2015). This paper explores current climate change mitigation and adaptation policies (CCMA), which propose no alterations to our current production-driven, consumption-oriented economy and encourage business to continue as usual. Such policies are difficult to explain and are embedded in complex systems of markets, finance, governance, and profits. Potentially dangerous alterations to the earth's climate drive the simple research question that grounds this article. How can 'business-as-usual' economic policies continue unchanged? Greed is often put forward as a logical explanation. Greed is surely part of it, and addiction, but it seems a shallow explanation. Others suggest the insatiable desire at the root of all human nature. This paper will not address the fallacy of human nature as a concept, but will attempt to disrupt human nature as an explanation.

Climate policy today seems to be burdened by economic and social policies that measure development progress, from least-developed to most-developed nations. In this short think piece, I begin excavating these policies and find their antecedents in deeply held and widely shared beliefs that have little to do with science or contemporary understandings of ecosystems and economics. I argue that the seemingly irrational decision to continue economic growth in the face of its radical consequences is situated in the origin stories of the planet's major civilizations. The exceptional status of the human animal and its special connection to divine bodies is at the core of these beliefs. Also fundamental to these origin stories are developing technologies of agriculture, healing, transportation, warfare, and then bringing these civilizing elements to all people of the planet through territorial conquest. The unquestioned benefits of these practices remain with us and are still practiced and honored today. When viewed through the lens of climate change, the rational for continuing the pursuit of population growth, agricultural

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expansion, rapid transport, and sophisticated weaponry should become difficult to defend. The fact that it endures as the only possible course of human progress should be of global concern.

This thought experiment begins by discussing the drivers of climate change and some recent statistics related to current levels of greenhouse gasses (GHG) in the atmosphere, and is followed by a discussion of the most prominent climate mitigation and adaptation strategies currently in use: biofuels, hydroelectric power, REDD+, solar

and wind power, climate resilient infrastructure and climate smart agriculture. The second part of this experiment considers the idea and historical precedents of ‘progress’, which I suggest is at the heart of why economic growth continues to be pursued with such ferocious abandon. I then offer a counter-narrative to the story of civilization and progress and conclude with some suggestions for rethinking how we define progress.

Statistics

According to the International Panel on Climate Change (IPCC) the main drivers of GHG emissions increase are economic and population growth. Population growth between 2000 and 2010 was roughly identical to the previous three decades and economic growth has risen sharply during the same period. (IPCC 2014). During this period global emissions have also risen sharply as the graph below illustrates.

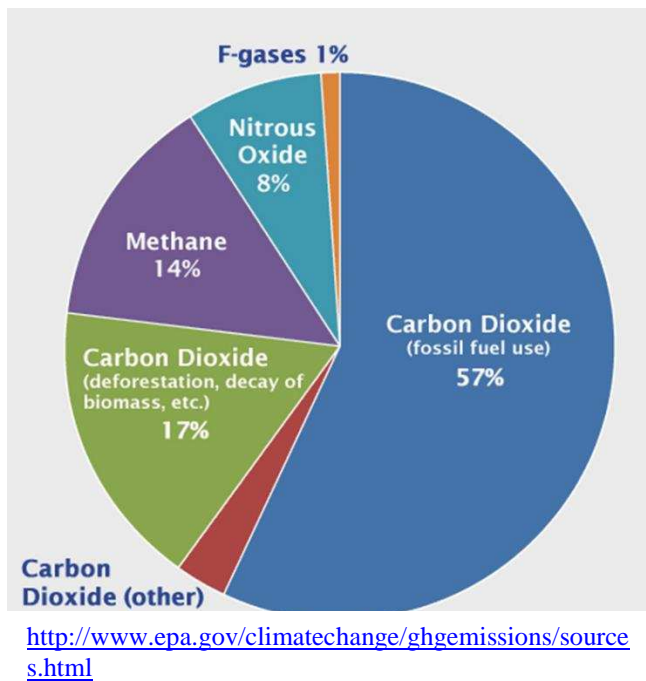
For the first time since we began tracking carbon dioxide in the global atmosphere, the monthly global average concentration of this greenhouse gas surpassed 400 parts per million in March 2015, “a significant milestone... [and] half of that rise has occurred since 1980” (NOAA 2016). For 25 of the 35 years since 1980, the international community has met in Conferences of the Parties (COP) to address the problems of climate change and to find solutions. As we can see from the graph above, these initiatives are having no effect on emissions and the carbon content of our atmosphere continues to rise. It only takes one minute of looking around any middle class life at any moment of any day to see why these numbers continue to climb. Looking around any developing country at the investment activities of global capital and commodities production and the picture becomes crystal clear.

Over 75% of gaseous emissions most responsible for GHG in the atmosphere come from carbon dioxide, which has 2 primary sources. The first comes from the direct burning of fossil fuels, which accounts for 57% of atmospheric GHG. The second comes from carbon dioxide released into the atmosphere through deforestation and biomass decay.

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Each CCMA policy currently promoted is directed toward reducing those carbon emissions. Importantly, the objective is to reduce the carbon without reducing the economic growth that supports such high carbon emissions. Biofuels, hydro power, and solar and wind energy are all attempts to replace fossil fuels, and the REDD+ program aims to decrease deforestation. Current research into these policies suggests that not only is their impact slight, but they are actually drivers of carbon emissions themselves. Additionally, policies for climate change adaptation drive carbon emissions and are pointed directly at the continuation of global development and the production economy. I will now demonstrate this for each.

Biofuels

Biofuels are derived from a variety of what have come to be known as ‘flex-crops’ and are being promoted as a clean energy source in many countries, notably the European Union and China. Flex-crops are crops and commodities that have multiple uses (food, feed, fuel, industrial material) that can be, or are thought to be, flexibly inter-changed. These include, but are not limited to soya (feed, food, biodiesel), sugarcane (food, ethanol), oil palm (food, biodiesel, commercial/industrial uses) corn (food, feed, ethanol) and cassava (food, feed, ethanol) (Borras et al. 2014). The production of these flex crops has increased dramatically in the past 7-10 years and climate change mitigation strategies are part of that increase. The increased investment in flex crops is not just a transformation of agricultural land already in use, large tracts of new land, especially in Africa, South America, and Southeast Asia, are being converted to agricultural production (Zoomers 2010). These new land conversions often take place in forested areas and the carbon emissions from deforestation or even the conversion of pasture land to agricultural production negate any emissions reduction from ethanol use for at least 30 years (Timilsina and Mevel 2013). Additionally, the destruction of forests destroys the planet’s carbon sink capacities.

Hydropower

Hydropower is especially interesting in the way it has shifted shape from being a demonstration of modernization and state power to being a source of clean green energy. While taking energy from natural water flows is low carbon, the creation of hydropower dams is a terribly carbon intensive enterprise (Zhang and Xu 2015). In addition to the carbon costs of construction and deforestation associated with dams, the water that fuels them is likely to dry up under the conditions of a changing climate (Koch et al. 2011) and their construction can be devastating to local communities and riverine ecosystems (Grimsditch 2012).

Solar and Wind

Solar and wind power are the least developed of the non-carbon based fuel sources and their development remains expensive and cumbersome. As with the alternative energy sources mentioned above, neither process is carbon neutral. The chemical processes involved in solar panel manufacture are not only carbon heavy, they produce toxic waste products that require carbon intensive infrastructure to contain. Interestingly, the use of ethanol to replace the toxic chemicals is offered up as a solution to the problem (Mulvaney 2014). Wind energy suffers carbon-intensive production as well, but does not have the same toxicity effects (Nugent and Sovacool 2014). Both technologies also convert land, sometimes over carbon sink areas like peat bogs (Gilligan 2013). Over time, both energy sources can decrease carbon emissions, but these technologies have limited lifespans (25-30 years) and high start-up carbon costs.

REDD+

Deforestation is a major contributor (almost 25%) to GHG emissions. Reducing Emissions from Deforestation and Forest Degradation is the only climate mitigation solution that actively attempts to slow land conversion by keeping standing forests. This noble plan is offset, however by the fact that carbon producing industrialized nations can “buy” these carbon stores from forest-rich nations as a way to meet their carbon emissions reductions promises. In effect they can pay another country to alter their ‘development’ trajectory so that they don’t have to alter their own. The REDD+ project is fraught with difficulties: continued deforestation (Milne 2012), unstable carbon markets (Corbera 2012), and little benefit for local communities where the projects are implemented (Atela, Quinn, and Minang 2014).

Climate Smart Agriculture

Climate Smart Agriculture is a popular solution not to mitigate, but to adapt to the coming effects of a changing climate. It advocates the integration of smallholder farmers into global agriculture production through enhanced technologies like specifically modified grains, irrigation infrastructure, and chemical fertilizers—all carbon heavy elements of agriculture. In a forthcoming study, Diepart and Jones suggest these projects are framed as a “triple-win solution” that will promote agricultural development and food security, enhance the resilience of agricultural systems and mitigate the effects of climate change (Diepart and Jones 2016). Their findings show decreased ecological resiliency, decreased food security, and increased social marginalization in areas where CSA projects have been implemented. These results strongly suggest that CSA is explicitly pointed toward securing global exports rather than ensuring local food supplies or enhancing the lives of local people.

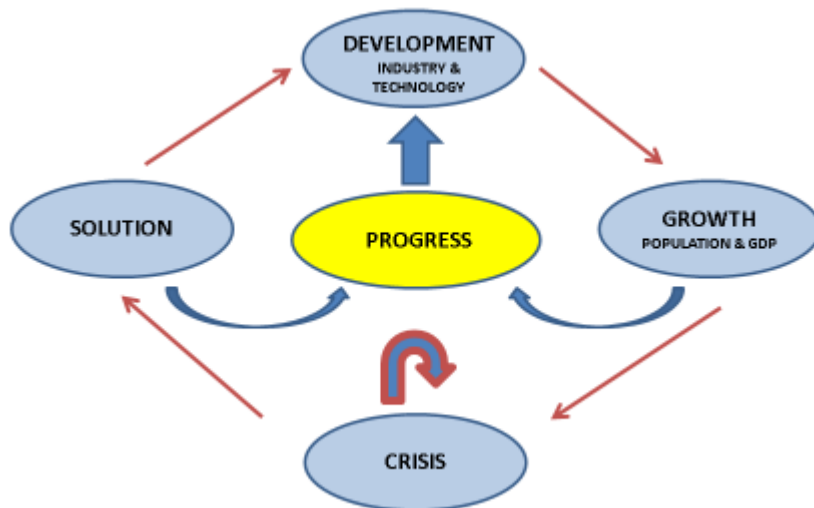
Climate Resilient infrastructure

I will not spend much time discussing climate resilient infrastructure, because the policies promote ‘development as usual’ only stronger and more carefully crafted. In a telling study, the concern driving the institution of climate resilient infrastructure was to “secure the long-term effectiveness” of \$130 billion dollars of development assistance and to “safeguard development progress” (Ranger, Harvey, and Garbett-Shiels 2014, 467).

On Progress

The idea of safeguarding development progress is at the heart of each one of the CCMA projects outlined above. Even though economic development is at the heart of the climate change dilemma, its continuance is at the heart of all possible solutions. Nowhere in the policy solutions do we hear discussions of reducing production, decreasing consumption, or allowing populations to shrink rather than grow. In fact, production is increasing, resource extraction is intensifying, populations are growing, and land conversions are intensifying. Why is that? The answer to this simple question is of course complicated and multi-faceted. I suggest, however, that one simple notion underlies the dense complexities visible on the surface of the problem. This is the idea of human progress.

The ICPP determines that the main drivers of climate change are economic development and population growth, as cited above. Our primary measures for civilizational progress are gross domestic production (GDP), low mortality rates for both infants and the elderly, and per capita income increases. These measures seem natural and right. Less death is good; more production is good. We might question, however, how something so self-evidently good could be producing such disastrous consequences. Our very measures of success are driving our demise. I suggest we are stuck in a negative feedback loop that looks crudely like this:



Progress is defined by technological advances that increasingly control natural processes, especially the production of food and the deferment of disease and death, but also mechanized travel and increased understanding of natural processes. These activities lead to growth, which in turn brings us to crisis. Now, this crisis is not in line with our notions of progress. We are progressing as a species and the fact that

there seems to be an environmental crisis does not contradict the fact that through new technologies and new industries we are living longer, having more babies, and acquiring more wealth and property than any civilization before us. This helps to explain in part the fact, outlined above, that all current solutions to the crisis of climate change find solutions that continue to execute 'progress' as it is currently defined.

Where does this definition of progress come from? The remainder of this paper is a bit of a thought experiment where I will outline some of the historical origins of this notion of human progress and in conclusion will offer a few radical suggestions for how to proceed.

The origins of progress

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The origin stories of the major civilizations on the planet suggest that the human animal has a special relationship with deities and is not the same as all the other species. Whether any of us continue to believe these stories is irrelevant, because the foundational idea of human exceptionalism (being separate from and better than other species) and belonging to societies beyond our planet (like other ‘advanced’ societies in outer space or the societies in heaven) remain powerfully with us. In many origin stories humans were created by deities (who have lives and civilizations in the sky). The creation of humans was separate from and above the other species also created by the deities. The Judeo-Christian bible states that the human has "dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth" (Genesis 1:28). In the Incan Popul Vuh, the deity wanted worshipers, “but the creatures can only squawk... They were not able to speak [the creator’s] names” (Christenson 2007, 65). Humans were eventually made of corn to worship and make offerings to the deities (181). The Rig-Veda of Hindu tradition describes the sacrifice of Puruṣa by the deities. Puruṣa is “all that yet hath been and all that is to be” (RV 10.90:12). From the dripping fat of Puruṣa comes the animals, from the body parts come the humans with the highest humans, the priests coming from the mouth. Importantly, the gods also come from the mouth of Puruṣa (RV 10.90). From China, the Five Emperors, at once human and divine, brought human society out from chaos and founded civilization. The Yellow Emperor, the Son of Heaven, “gave birth to the myriad creatures in order to give them to people... [because] Of all living creatures, none are of greater value than humans” (Csikszentmihalyi 2006, 42).

In addition to human superiority and exceptionalism, embedded in each of these stories is the idea of agricultural production and technological innovation. Izanagi and Izanami, of Japanese lore created the sun god, Amaterasu, who sent his son to bring peace and rice to the islands (Kojiki 1:34); Adam and Eve were to cultivate the garden of Eden (Gen 2:15); the Yellow Emperor brought the technologies of agriculture, medicine, and military power to pacify the lands (Sima 1994); and the word arya, “cultivator,” is the one term in the Rig-Veda which distinguishes the conquerors as a class from the aborigines of the country (Dutt 1893). Each collection of stories from each of civilization called upon here are different and complex. There are important similarities, however, and one is the extensive tales of conquering other peoples and the peace and benefits that come through ever more powerful technologies of war, medicine, food production and travel.

Our contemporary society continues to value such exploits and considers each new technological feat to be an advancement of human society. This is how we define progress and we revere the ruins of these ancient conquerors.

Is this really progress?

The story of human progress has changed little in the 5000 years since the earliest cities were built. The power of the technologies is greater than ever before, but the basic components remain. In this era of crisis, the bringers of progress respond as if the human is exempt from the natural laws of this planet, exemplified by solutions to the crisis outlined above, which only exacerbate the issue. The impunity with which natural laws are violated through development and progress is eerily inverted and then reproduced in the laws of civilization. The tribes and

indigenous people, the conquered, must submit to the laws of the city builders. Archeologically, we find that conquering civilizations take over the land of others and assign these others to low-status positions in the service of their conquerors (see for example, Keatinge & Conrad 1983 in ancient Peru). Historical documents describe the benevolent nature of these take-overs and tell of civilizing the hordes, natives, or tribes (see for example, Yukinori 2007, from ancient Japan). More recently we find discourses of bringing development and new livelihood strategies to indigenous people recently excluded from their forest resources (Pokharel et al. 2007), or to tribes now devoid of grazing lands (Catley, Lind, and Scoones 2013). There seems to be no question that those who have accumulated less will conform to the obvious superiority of those bringing them progress.

Importantly, there is no exemption for the conquered. If they believe in a different notion of progress and stand up to the more powerful technologies of the accumulators—they get shot (see for example, Watts 2016, from Honduras), they get put in prison (see for example Chaung Phoesan & Chen Dene-Hern 2014, from Myanmar), or they are ignored and impoverished while progress continues (Baker and McKenzie 2014).

Considerations in conclusion

The decision makers at the top of this farcical display of progress seem to be working full time to ensure that one vision of human progress be enacted. Giant agricultural corporations promote unsustainable practices to ensure the continued production of excess grains, international finance bankrolls agricultural production in search of non-fossil fuel sources, and forests and streams are converted to squeeze out ever more energy crucial to the pursuit of human progress.

Dissenters are shot.

And, the temperature rises.

While we do not collectively believe in the creation stories of the ancients, the idea that the human animal is separate from, superior to, and privileged remains a powerful story. This privileged status is foisted upon all non-human species on the planet, and is also leveled against the under-privileged, the under-developed, and the non-civilized others. A papal decree, *Sublimis Deus*, was required in 1537 to declare that indigenous peoples were rational beings with souls and must not be enslaved. It was not followed, but was written nonetheless. Such decrees haunt the Universal Declaration of Human Rights enacted in 1948, which despite its good intentions continues to be ignored by international business and most governments in their dealings with the under-privileged, the under-developed, and the non-civilized. Any one of us could fall into the ‘under’ belly of this system at any time. We should be concerned.

In response and in conclusion I offer just three important suggestions. The first is that we are not exempt from the laws of this planet and there is no technology that can change this fact. Second, overproduction depletes vital ecological resources, increases elite profits unduly, and is wasteful (this includes the overproduction of humans). Finally, we are not deities. We die.

Progress is understanding the delicate balance between life and death. Evolution is joining the living community with whom we share this planet and with whom we will adapt through the next permutation of life on this rock.

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