

A Tale of Two Walls: A Comparison of the Green Wall Projects in Inner Mongolia and the Sahelo-Saharan Regions

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Abstract

Desertification as a bio-physical stressor threatens food and water security, and is exacerbated by climate change. Other issues such as peace, gender equity, and livelihood are some examples of socio-economic issues also connected to desertification. This is apparent in the cases of Inner Mongolia and the Sahelo-Saharan region, where desertification has spurred the creation of afforestation projects, colloquially known as “Green Walls”: these are the Three-North Shelterbelt Project, and the Great Green Wall of the Sahara and the Sahel Initiative, respectively. This paper explores the principles of environmental ethics (such as vulnerability, common goods, biological and cultural diversity, and environmental virtues) in the two Green

Wall projects and compares these in their respective environmental management strategies. The paper concludes that both Green Wall projects can benefit from collaboration such as an exchange of knowledge and effective methods and practices. These include the capacity of the Chinese State in resource mobilization and of the African Union's emphasis on organization at the grassroots level.

Keywords: *Africa, China, climate refugees, desertification, environmental ethics, environmental management, Green Walls, Inner Mongolia, Sahara, Sahel, vegetation*

Desertification is a phenomenon characterized by the loss of land productivity by at least 10 percent. This results from a number of factors that include deforestation, overgrazing, and soil erosion and is exacerbated by climate change.¹ This form of land degradation occurs in different parts of the world, notably in Inner Mongolia in northern China and in the Sahelo-Saharan region in Africa. In the Chinese northwest, vulnerable farmlands that border the deserts to the north are under threat from expansion of

¹ Jay Withgott and Matthew Laposata, "The Underpinnings of Agriculture," in *Environment: The Science Behind the Stories*, 6th ed. (New York: Pearson, 2018), 208–233.

these deserts, mainly due to overgrazing.² The dust storms from Inner Mongolia blow not only to Beijing and other cities and settlements to the south, but also across the Pacific Ocean to North America. Similarly, dust storms from the Saharan Desert blow across the Atlantic Ocean to the Caribbean Sea.³

Desertification forces rural communities who live on the fringes of vulnerable land to become climate refugees by relocating to cities or crowding to other, less vulnerable lands, at times even migrating to other countries. In the Sahelo-Saharan region, desertification threatens food and water security, giving rise to socio-economic issues related to civil conflict, gender inequity, and livelihood. The Chinese government and the African Union have enacted afforestation projects colloquially known as “green walls” in an attempt to combat desertification. These are the Three-North Shelterbelt Project in Inner Mongolia, and the Great Green Wall of the Sahara and the Sahel Initiative in the Sahel. This paper explores the principles of environmental ethics and environmental virtues, and concludes that the Chinese State and the African Union can benefit from collaboration, which includes an exchange of knowledge and effective methods and practices.

²Alexandra E. Petri, “China’s ‘Great Green Wall’ Fights Expanding Desert,” April 21, 2017, <https://news.nationalgeographic.com/2017/04/china-great-green-wall-gobi-tengger-desertification/>.

³Withgott and Laposata, “The Underpinnings of Agriculture.”

Inner Mongolia, China

Vulnerability

Khanbaliq or “City of the Khan” was built almost 700 years ago to serve as the capital of the Mongol Empire in China. The Great Wall on the northern borders of the Song Empire had failed to repel the Mongolian steppe riders. Three and a half centuries later, the wall would again fail to keep the Manchurian clans out of the failing Ming Empire. By then, Khanbaliq had been renamed Beijing, or “Northern Capital.”

Today, the Northern Capital is the soul of the global Sinosphere, rivalling other cities such as cosmopolitan Shanghai, dynamic Hong Kong, and liberal Taipei. It remains the center of the People’s Republic of China, an East Asian behemoth that has seen exponential growth in its economy and technology. Growth, however, comes at a price; and the People’s Republic has inherited from its imperial predecessors the same geographical problem of vulnerability to the north. China faces yet another northern invasion, not of Mongolian steppe riders or Manchurian clans, but of sand.

Every spring, Beijing and other northern cities are invaded by an army of sand from the Gobi and Taklamakan deserts in the north and northwest.⁴ These sandstorms have

⁴ David Lao, “China is Building a Great Green Wall of Trees to Stop Desertification,” February 19, 2016, <http://theplaidzebra.com/china-is-building-a-great-green-wall-of-trees-to-stop-desertification/>.

always been a part of life in the north, but with worsening climate change their frequency and intensity have increased, driven further by desertification.⁵ Ecological deterioration of the northern plains has expanded the deserts, ceding once fertile grasslands to the invaders. Overgrazing, water-intensive agriculture, and firewood gathering are among the main reasons for this deterioration.⁶ However, the coal industry has fast outpaced these pastoral activities in recent decades. In a bid to decrease urban air pollution, coal plants had been moved to less populated areas in the north and west.⁷ The industry consumes and pollutes groundwater, handing local vegetation a death sentence. As the plants die, the desert marches in.

During the early years of the nation, a building spree saw the razing of farm and wild lands in a rush to build cities and forcibly zone farming areas to other regions.⁸ The mad rush to make room for advancements in mining and farming contributed to the desertification and the southward march of the sands. Aside from ecological impacts, this also leads to an annual economic loss of around \$6.5 billion.

The very geography of the region has greatly altered in the last few centuries: In 407 AD, Inner Mongolia was described as having lush grasslands and clear rivers. Yet in

⁵ Petri, “China’s ‘Great Green Wall’ Fights Expanding Desert.”

⁶ *Ibid.*

⁷ Anna Finke, “China’s Great Green Wall Against Sandstorms,” June 16, 2017. <https://radiichina.com/chinas-great-green-wall-against-sandstorms/>.

⁸ Petri, “China’s ‘Great Green Wall’ Fights Expanding Desert.”

the span of five centuries, the Tang Dynasty poet Xu Tan spoke instead of desert and barren earth. The expanded desert was an artificial desert.⁹ The drive of industrialization and pollution in the last century has only exacerbated the continuous ecological degradation of the land.

The Three-North Shelterbelt Project

China planned to build a new wall to face this northern foe. In 1978, it inked into creation the Three-North Shelterbelt Project, named after the three northern regions it was meant to defend: the northwest, north, and northeast.¹⁰ In common parlance, it has been christened as the Great Green Wall. The plan is to create a 4,480-kilometer wall of trees along Northern China spanning thirteen provinces.¹¹ It is the largest tree-planting project in the world, and is scheduled to end by 2050. It aims to stop desertification of the north and increase the world's forest cover by more than 10 percent by planting an estimated 100 billion trees, of which 66 billion have been recorded to have already been planted through aerial seeding and cash incentives to farmers.¹² By all measures it is nothing short of ambitious, and the gears of the Chinese machinery have worked and marched toward achieving these lofty goals.

⁹ Finke, "China's Great Green Wall Against Sandstorms."

¹⁰ Lao, "China is Building a Great Green Wall of Trees."

¹¹ Finke, "China's Great Green Wall Against Sandstorms."

¹² "Great Green Wall," *The Economist*, August 23, 2014, <https://www.economist.com/international/2014/08/23/great-green-wall>.

The government's top-down approach has seen grazing bans, incentivizing the planting of certain crops, and restricting lumbering practices in degraded lands.¹³ In the context of the current global environmental movement, such initiatives will prove to be crucial. This is especially true given expectations that China, India, and the European Union will lead global efforts of the environmental movement following the vacuum left by the United States of America when it announced its withdrawal from the Paris Agreement.¹⁴

This new Great Wall, like its stone counterpart, has seen some success with some areas experiencing fewer sandstorms.¹⁵ For the most part however, it has failed to keep the attackers at bay; farms on the fringes are constantly buffeted by increased storms, which can occur three to ten times a month, destroying crops and damaging infrastructures. The storms affect not only the livelihoods of thousands of farming communities on the edge of the invading sands, but also their way of life. They are faced with economic pressure worsened by the high mortality rates of their crops. Together with the bio-physical stressor of desertification, farmers, their families, and whole

¹³ Finke, "China's Great Green Wall Against Sandstorms."

¹⁴ Lei Liu, Tong Wu, and Ziqianhong Wan. "EU-China relationship in a new era of global climate governance," *Asia Europe Journal* 17, no. 2 (2019): 243–254.

¹⁵ Finke, "China's Great Green Wall Against Sandstorms."

communities are forced to choose: remain on the vanguard or join the stream of climate refugees in the cities.¹⁶

Precautionary Principle and Biological Diversity

Criticism of the project is rife with pointed observations that lavish ceremonies—a hallmark of Chinese culture—that see hordes of saplings planted are rarely monitored or managed afterwards. Another issue is the miscalculation of the carrying capacities of the target areas at a given time: vigorous afforestation can exert more pressure on existing water sources such as already-diminishing groundwater, ultimately threatening to exceed the carrying capacity, of the land itself.¹⁷ A lack of understanding of the land's carrying capacity coupled with a lack of monitoring, contribute to sapling mortality. The Beijing Forestry University estimates that only 15 percent of the trees planted since 1949, before the Green Wall's inception, are still surviving.¹⁸

Continued monitoring and managing of the saplings are not the only issue in the question of tree mortality. The composition of the trees themselves are a critical factor: centrally-planned afforestation took almost no consideration of local conditions and climates, instead using water-intensive species which were then planted in monocultures, many of which grew unhealthy from inhospitable

¹⁶ Petri, "China's 'Great Green Wall' Fights Expanding Desert."

¹⁷ Ibid.

¹⁸ Lao, "China is Building a Great Green Wall of Trees."

environments or were attacked by pests and almost completely eradicated.¹⁹ Such was the case in 2000, when a reported 1 billion poplar trees were eradicated by a beetle infestation.²⁰ These monocultures instead worsened already-flagging water security and became paper sentries, worsening the battle against the deserts. In spite of noble intentions on the part of the Chinese State, the scale of the consequences that the program has produced may not have been completely in line with their vision of combating desertification through afforestation. Failure to consistently manage and monitor these areas has wasted the resources and time of the hunkering Chinese machinery. The mad rush to plant trees should instead have been preceded by consultations at the local level and with the planting of grasses and shrubs, which consume less water.²¹

While the project itself sought to address the vulnerability of the Inner Mongolian region and its environs, it failed to consider the precautionary principle—an environmental virtue. This principle advocates extreme prudence: it is a

¹⁹ Andrew Bracken, Evan Cunningham, Will Sadler, and Andreas Moe, “21st Century Desertification in China,” YouTube video, 5:00, posted by Tufts ENVS on February 28, 2018, https://www.youtube.com/watch?v=3lJOQD4_neA.

²⁰ Vince Beiser, “China’s Green Great Wall is on the Front Line of Its Fight Against Desertification, but Is It Sustainable?,” *South China Morning Post*, December 21, 2018, <https://www.msn.com/en-sg/news/other/chinas-green-great-wall-is-on-the-front-line-of-its-fight-against-desertification-but-is-it-sustainable/ar-BBR14qG>.

²¹ Finke, “China’s Great Green Wall Against Sandstorms.”

tool used for anticipatory measures toward an activity or series of activities, and it is applied when there is uncertainty on the magnitude of effects and whether or not these will cause some form of harm. This principle can be applied to extant issues such as sapling management, biodiversity, and water use. It also advocates that actions must be participatory and inclusive, that is, involving local communities in consultations and in action and management plans.²²

This is not to say that China's mobilization to address desertification is without merit, far from it. Aforementioned issues such as sapling management, species composition, water-intensive land use, and grazing practices are old concerns being addressed with every phase of the project.²³ Locally, the Great Green Wall is in its fifth phase of execution. Questions such as the quality, suitability, and mortality of planted saplings are being addressed; and local residents are incentivized to plant shrubs and other forms of greenery—not just trees.²⁴ Nationally, the Chinese government has passed a series of laws since the early 2000s to return a number of farm and grazing lands to their natural

²² COMEST, *The Precautionary Principle* (Paris: United Nations Educational, Scientific and Cultural Organization, March 2005), <https://unesdoc.unesco.org/ark:/48223/pf0000139578>.

²³ COMEST, *The Precautionary Principle*.

²⁴ Lao, "China is Building a Great Green Wall of Trees."

states of grasslands and forests.²⁵ Now, the Great Green Wall also welcomes international partners, such as the Japanese NGO Brother Earth that has worked with local farming communities since 2012 and encourages changing grazing patterns of livestock and the planting of herbs that can later be sold for medicinal purposes.²⁶

The Sahel, Africa

Vulnerability

Meanwhile, halfway across the world in the Sahel region, a different wall yields a different story. The Sahel is a grassland area with sparse woodlands spanning 5,400 kilometers from the Atlantic Ocean to the Red Sea—an ecotone between the forests to the south and the Sahara Desert to the north.²⁷ Increased desertification has also meant a southward march for this desert creeping into the Sahel and creating a geographic region vulnerable to increased degradation. Socio-economic issues, such as the Mediterranean migrant crisis; the Boko Haram massacres in Chad; terrorist attacks in Burkina Faso and Mali; poverty; food and water shortages, are compounded by climate change. By 2020,

²⁵ Petri, “China’s ‘Great Green Wall’ Fights Expanding Desert.”

²⁶ “Project for Combating Desertification in Inner Mongolia,” YouTube video, 9:24, posted by BrotherEarthJp on July 22, 2014, <https://www.youtube.com/watch?v=lxSTU4UtXw>.

²⁷ “The Great Green Wall,” YouTube video, 5:59, posted by Al Jazeera English on September 30, 2011, <https://www.youtube.com/watch?v=bdRDfXFjgZg>.

desertification is expected to displace over 60 million climate refugees—the biggest diaspora since World War II.²⁸

Forced by both socio-economic and bio-physical pressures, push migration seems to be the only way out for those in dire straits. Many of these refugees are expected to move to Northern Africa or Europe, with some being trapped en route in Libya where they are publicly auctioned as slaves—a grim existence for the peoples of one of the world's poorest regions.²⁹

The Great Green Wall of the Sahara and the Sahel Initiative

The African Union adopted the \$8 billion project called the Great Green Wall of the Sahara and the Sahel Initiative (GGWSSI) in 2007. This project was backed by international partners such as the World Bank, European Union, United Nations Convention to Combat Desertification, and even the French government.³⁰ The GGWSSI's ultimate goal is to restore between 50 to 100 million hectares of land,³¹

²⁸ Jill Filipovic, "Will Africa's Great Green Wall Discourage Migration to Europe?," *The Guardian*, July 19, 2017, <https://www.theguardian.com/global-development-professionals-network/2017/jul/19/will-africas-great-green-wall-discourage-migration-to-europe>.

²⁹ Alex Muiruri, "Will the Great Green Wall of Africa Stop Endless Immigration to Europe?," April 9, 2018, <https://citizentruth.org/great-green-wall-of-africa/>.

³⁰ United Nations Convention to Combat Desertification, "The Great Green Wall Initiative," n.d., <https://www.unccd.int/actions/great-green-wall-initiative>.

³¹ Muiruri, "Will the Great Green Wall of Africa Stop Endless Immigration to Europe?"

sequester 250 million tons of carbon,³² provide food security for 20 million people by giving access to climate change-resilient agricultural technologies, and provide between 350,000 to 10 million green jobs.³³ The first seed of this project was planted in Senegal in 2008.³⁴ In the absence of an aggressive machinery like the Chinese government's, to call it ambitious is an understatement—it seemed more akin to a dream.

Originally an inter-state agreement among eleven countries from Senegal in the west to Djibouti in the east—with the partner countries Burkina Faso, Chad, Eritrea, Ethiopia, Mali, Mauritania, Niger, Nigeria, and Sudan between them—it was envisioned as a wall of trees spanning 8,000 kilometers across the width of the African continent.³⁵ However, critics were quick to point out that a desert was in itself a natural ecosystem; it wasn't moving south in so much as overuse was denuding the land.³⁶ Large swaths of the

³² Andrew Bilski, "Africa's Great Green Wall: A Work in Progress," *Landscape News*, August 3, 2018, <https://news.globallandscapesforum.org/28687/africas-great-green-wall-a-work-in-progress/>.

³³ United Nations Convention to Combat Desertification, "The Great Green Wall Initiative."

³⁴ "The Great Green Wall," YouTube video, 5:59, posted by Al Jazeera English.

³⁵ "The Great Green Wall of Africa: Will It Help Fight Climate Change?," YouTube video, 8:36, posted by BBC Newsnight on August 11, 2017, <https://www.youtube.com/watch?v=HVOYN70scS8>.

³⁶ Lars Laestadius, "Africa has Plans for a Great Green Wall: Why the Idea Needs a Rethink," *Science Nordic*, February 8, 2018, <http://sciencenordic.com/africa-has-plans-great-green-wall-why-idea-needs-rethink>.

identified area were also uninhabited, leaving a gap in monitoring and management, and rendering the sustainability of the project itself questionable; delays were making its feasibility vulnerable.³⁷

Participatory Action and Bio-Cultural Diversity

Alternatively, its delays could also be a blessing. With its Chinese counterpart as a reference, delays in the project as well as criticism have forced a review of the GGWSSI, its goals, and methods for beneficial results. The project involved another ten countries (Algeria, Benin, Cameroon, Cape Verde, Egypt, Gambia, Ghana, Libya, Somalia, and Tunisia), bringing the total to 21 countries. These 21 countries straddle the Sahara, and are collectively known as the Pan-African Agency of the Great Green Wall.³⁸ The wall itself is also changing. No longer simply a wall of trees, it is a wall of diverse vegetation including plants and shrubs around the Sahara envisioned to be as much as three times the size of the Great Barrier Reef.³⁹

Diversity in vegetation necessarily entails an emphasis on avoiding monocultures and ensuring biodiversity, especially

³⁷ Jim Morrison, "The 'Great Green Wall' Didn't Stop Desertification, but It Evolved Into Something That Might," *Smithsonian.com*, August 23, 2016, <https://www.smithsonianmag.com/science-nature/great-green-wall-stop-desertification-not-so-much-180960171/>.

³⁸ Great Green Wall, "Partners," n.d., <https://www.greatgreenwall.org/partners>.

³⁹ United Nations Convention to Combat Desertification, "The Great Green Wall Initiative."

drought-resistant indigenous species which generations of farmers have worked alongside with. This biodiversity strengthens the emergent ecosystems that managers and communities on the ground wish to build. The genetic diversity acts as added security against pests and diseases by avoiding total eradication. It also encourages habitat complexity for other plant and animal species that may eventually grow in these areas, which will further add to the genetic diversity of the ecosystems.

Further inspection reveals that biodiversity is not the only factor working in the GGWSSI's favor. Local contexts and conditions are important to consider, seeing as the project spans the width of the continent and involves 21 countries, each with diverse communities and tribes. The wall is essentially a bottom-up approach of ecological restoration; a patchwork of local efforts forming a mosaic of land use practices.⁴⁰ The focus has moved from forestry to sustainable land and water management.⁴¹ The ambition remains, albeit in a different package.

Local strategies focus on farmer-managed natural regeneration, which is a balance between clearing the land and letting it go wild to return to its ecological memory.⁴² Farmers revive the roots of plants and trees to encourage

⁴⁰ Morrison, "The 'Great Green Wall' Didn't Stop Desertification."

⁴¹ Bilski, "Africa's Great Green Wall."

⁴² Laestadius, "Africa has Plans for a Great Green Wall."

new shoots, as these have better chances of survival than new saplings that still need to grow roots. Trees that naturally grow in their plots are protected instead of cut, and farmers grow crops around them—not in spite of them. Water retention techniques include digging “half-moon” pits, building “zai” or grids of deep pits on rock-hard plots, and putting stone barriers around selected fields. All these methods encourage water infiltration into the soil by concentrating it in certain areas.⁴³

The project encouraged the development of a healthy and robust ecosystem by encouraging biological and cultural diversity in the implementation of the GGWSSI. In adopting an inclusive and decentralized approach, it encouraged participatory action. This celebration of cultural diversity of the population base along the GGWSSI promotes a pluralistic framework by which the management and benefits of the program are charted together.⁴⁴ It is well-documented throughout the body of literature that forestry programs tend to be successful when it involves local communities. However, without clearly identifying the social actors or the “participants” and without clear benefit

⁴³ Morrison, “The ‘Great Green Wall’ Didn’t Stop Desertification.”

⁴⁴ COMEST, “Ethical Principles for Climate Change: Adaptation and Mitigation Report of COMEST,” report adopted at the 9th Ordinary Session of COMEST, UNESCO Headquarters, 28 September– 2 October 2015, <https://unesdoc.unesco.org/ark:/48223/pf0000234529>.

distribution, programs then tend toward lackluster results at best or even become wholly misguided at worst.⁴⁵

Environmental Virtues and the Common Good

The decentralized and participatory approach toward stewardship of vegetation allows a sense of ownership to take root within the local communities. The trees, shrubs, and other plant life become more than simply a consequence of biological and climatological phenomena, but become tangible symbols of a common good transcending the natural environment. In fact, the much-celebrated principle of the common good manifests itself as it becomes the shared benefit of the communities along the GGWSSI. Welfare, livelihood, peace, and security are in themselves the intangible common goods that are borne of having the vegetation as a shared resource. This results in communities seeing these common goods as benefits which are the fruits of collective action. For as long as there is an understanding that their interests are aligned with maintaining these common goods in their many forms, their protection and proliferation thus becomes a common and sustained goal.⁴⁶

⁴⁵ Sk. Ahiul Islam and Md. Mijanur Rahman, “Coastal Afforestation in Bangladesh to Combat Climate Change Induced Hazards,” *Journal of Science, Technology & Environment Informatics* 2, no.1 (July 2015): 13–25.

⁴⁶ Michael M. Cernea, “User Groups as Producers in Participatory Afforestation Strategies”(Washington, D.C.: The World Bank,1989),

In 2016, 1.2 million hectares were restored in Mali. In 2017, a reported 15 million hectares were restored in Ethiopia, 5 million in Nigeria, and 2,000 in Sudan.⁴⁷ By 2018, a reported 5 million in Niger were added to the growing list, along with 25,000 in Senegal, and 2,500 in Burkina Faso.⁴⁸ Newer partners such as Cameroon and Ghana have just begun work in 2016.⁴⁹ The GGWSSI has given Niger an estimated additional 500,000 tons of cereal grain a year, enough to feed 2.5 million people at a low investment cost of just \$20 per hectare.⁵⁰ Falling leaves also serve as food for cattle and the *Faidherbi albida* (apple-ring acacia or gao), a native species, sheds its leaves during the growing season giving plants organic compost and access to direct sunlight.⁵¹ Progress is slow, but promising.

In Koyli Alfa, a village in Senegal, over 300 women work in a communal garden. Every week they contribute 100 West African francs (equivalent to approximately 8.80 Philippine pesos) to a tontine—a communal pot of money—as a safety net. The surrounding lettuce, eggplants, and watermelons are a larger safety net and represent hope for the future of their

<http://documents.worldbank.org/curated/en/742751468739271216/pdf/multi-page.pdf>.

⁴⁷ Filipovic, “Will Africa’s Great Green Wall Discourage Migration to Europe?”

⁴⁸ United Nations Convention to Combat Desertification, “The Great Green Wall Initiative.”

⁴⁹ Morrison, “The ‘Great Green Wall’ Didn’t Stop Desertification.”

⁵⁰ Bilski, “Africa’s Great Green Wall.”

⁵¹ Morrison, “The ‘Great Green Wall’ Didn’t Stop Desertification.”

families.⁵² Frugality, an environmental virtue borne of temperance, characterizes the management of the communal garden where the women are trained in managing their finances and growing food resources. This provides the women an opportunity to become empowered by providing for their families and establishing themselves as breadwinners. This is especially important in patriarchal societies, where the men have migrated to other places such as Northern Africa or Europe in search of better livelihood options.⁵³

It is important to address another environmental virtue at play, one borne out of courage: resilience. Resilience entails a spiritual infrastructure that must either be created or expanded;⁵⁴ one which allows an individual or a community to recover from loss and not simply to survive, but to work towards a point where they may thrive. The development of a spiritual infrastructure also goes hand-in-hand with social engineering, or the formation of group dynamics among shareholders in the local community.⁵⁵ The choice to invest in vegetation such as trees is an inter-generational investment. It bequeaths not only the physical roots and

⁵² Muiruri, “Will the Great Green Wall of Africa Stop Endless Immigration to Europe?”

⁵³ “The Great Green Wall of Africa: Will it help fight climate change?,” YouTube video, 8:36, posted by BBC Newsnight.

⁵⁴ COMEST, “Ethical Principles for Climate Change.”

⁵⁵ Cernea, “User Groups as Producers.”

leaves of the vegetation, but also the food and water security, livelihood, and growing peace to the next generation. Rome was not built in a day, and neither is a forest. With the development of patches of vegetation in farms, public lands, and local gardens such as that in Koyli Alfa, resilience is thus built little by little and seed by seed.

The development on the ground seems promising. But it is important to note that the GGWSSI pays for water and fertilizer and it will take years of training and support to make interventions, such as Koyli Alfa's gardens, self-sustaining. It is a sobering truth, but one that project managers and local communities are ready to face—for the land and for their families.⁵⁶ This willingness to forge through difficulties together expresses a solidarity borne out of justice—yet another environmental virtue.

Solidarity as an environmental virtue is a matter of relationships and the rights afforded to each party.⁵⁷ In the case of the GGWSSI, these include not only the relationships and rights between project managers, local governments, and communities, but also between humans and the earth they work with. Solidarity is expressed in the desire of the project to use vegetation not only to address the degradation of the land, but also to address inequity and

⁵⁶ Filipovic, "Will Africa's Great Green Wall Discourage Migration to Europe?"

⁵⁷ COMEST, "Ethical Principles for Climate Change."

conflict by mobilizing and reaching out to the local communities at the fringes.

This solidarity is a collective action addressed toward regenerating and maintaining the common good. The common good or the “commons” can be described as the resources found in the environment around us whose access and use is for everyone.⁵⁸ The very premise of the common good is that ownership rests not on any one individual, but on a community of users whose interests are not simply for their benefit in the present, but is intergenerational. In this sense, solidarity is not merely among fellow contemporaries with whom users commune with, but also with future users.⁵⁹ However, it must be noted that the idea of the common good also extends beyond its physical attributes. What makes them the “commons” is also a combination of the resources, the users, the rules which the community of users operate around,⁶⁰ and additionally, the relationships between all users. As users shape these goods, so too do the goods shape the behavior of users; the identity of the commons is therefore not simply defined by its utility or

⁵⁸ David Bollier and Silke Helfrich, eds., “Eight Points of Orientation for Commoning,” in *Patterns of Commoning* (Massachusetts, Germany, Thailand: Common Strategies Group, 2015), 72–73.

⁵⁹ David Bollier and Silke Helfrich, eds., “Can Commoners Become Self-aware of Their Collective Potential?,” in *Patterns of Commoning* (Massachusetts, Germany, Thailand: Common Strategies Group, 2015), 79–83.

⁶⁰ David Bollier and Silke Helfrich, eds., “Patterns of Commoning: How We Can Bring About a Language of Commoning,” in *Patterns of Commoning* (Massachusetts, Germany, Thailand: Common Strategies Group, 2015), 44–69.

attributes, but also by how users experience and operate around them.⁶¹

A betrayal of collective interests which serves only the individual leads to the concept of the “tragedy of the commons.” This occurs when users of the shared resource seek to maximize individual gain by taking more of the resources, and leaving less of the remaining stock for other users. Without the regulating function of a group consensus, solidarity is lost and resources become scarce, eventually becoming exclusive or totally depleted.⁶²

To act for the benefit of the commons is essentially to act for the benefit of the collective over the self. The individual exercises temperance; and there is a collective consensus over the use of the resources. In essence, it is sacrificing short-term self-interest for the long-term benefit of all users. This harkens back to the concept of social engineering within the communities that share the communal garden, or those who act as caretakers of the forests—because the commons are regulated by an agreed-upon set of rules and conduct of use, designed by a group for the benefit of the group, solidarity with the commons is maintained.⁶³

⁶¹ Bollier and Helfrich, “Can Commoners Become Self-Aware.”

⁶² Garret Hardin, “The Tragedy of the Commons,” *Science* 162, no. 3859 (December 13, 1968): 1243–1248, http://www.geo.mtu.edu/~asmayer/rural_sustain/governance/Hardin%201968.pdf.

⁶³ Ibid.

Conclusion

Best Practices

Given China's expected leadership role in the global environmental movement, increased collaboration between China and the Pan-African Agency of the Great Green Wall holds much promise.⁶⁴ The incredible successes of the Chinese state in the rehabilitation of the Loess Plateau, a region that was threatened with soil erosion, employed a combination of government incentives for reforestation and other regulations. These incentives were much like those used on the Three-North Shelterbelt Project and were further complemented by other regulations such as crop rotation, watershed management, and zoning.⁶⁵

More recently, the Chinese government has begun restoring the Miyun watershed, located 80 kilometers northeast of Beijing. Seeking to combat deforestation and to restore the land to improve water quality and recharge the water table, the project comes with the recognition that simple, large-scale solutions are insufficient; and that attention needs to be given to issues such as biodiversity, soil quality, and livelihood issues of local communities. It

⁶⁴ Christiana Figueres, Tom Rivett-Carnac, and Paul Dickinson, "All About EU with Miguel Arias Cañete," *Outrage and Optimism*, podcast audio, July 4, 2019, <http://outrageandoptimism.libsyn.com/11-all-about-eu-with-miguel-arias-caete>.

⁶⁵ Environmental Education Media Project, "Loess Plateau Watershed Rehabilitation Project," August 5, 2013, <http://eempc.org/loess-plateau-watershed-rehabilitation-project/>.

has partnered with local and international organizations such as the International Union for Conservation of Nature (IUCN), Society for Ecological Restoration, Brazil's Atlantic Forest Restoration Pact, and World Resources Institute Brazil to learn restoration techniques for the watershed area.⁶⁶

The Loess Plateau, Miyun watershed, and the Three-North Shelterbelt Project are testaments to the strides that an authoritarian state with powers of resource mobilization can accomplish. Of course, just as certain species are more suited to certain areas, certain management techniques and strategies may be more suited to certain contexts. It is interesting to note the different management techniques employed in the three projects, and it excites the mind to wonder what the Chinese machinery can accomplish in Inner Mongolia if guided by the principles of environmental ethics and environmental values present in the African Union's Green Wall. Conversely, it may also be interesting to ponder the pace of progress the African Union can achieve by studying and collaborating with their Chinese counterparts on resource mobilization.

⁶⁶ "Trees for Water – China. Exploring Forest Landscape Restoration for Beijing," YouTube video, 7:42, posted by IUCN, International Union for Conservation of Nature on March 10, 2015, <https://www.youtube.com/watch?v=CVwn0GkJvJL>.

Mobilization at the Grassroots Level

Both walls acknowledge the impetus to act in the present to avoid rising mitigation costs in the future, but in the Sahelo-Sarahan region of Africa these investments seem to have better returns. The GGWSSI allows communities to increase their capacity for resilience. But in building resilience and the security for the self, the consequent spiritual infrastructure allows for other forms of courage to arise. Courage in the form of compassion for others emerges on several levels: compassion of project managers with those on the ground; compassion for families, communities, and future generations in the pursuit of peace-building; and compassion of the people with the land and the rest of the environment. Justice through solidarity seeks to remedy socio-economic inequities, conflict, and degradation of the land. The dream of land to regain its ability to become a life-giving entity is now a growing reality.

Beijing's sandstorms can be better addressed by building on local stewardship and devolving responsibilities to local communities. Thus far, we have seen small steps towards a hybrid between the top-down and bottom-up approaches with the Three-North Shelterbelt Project. Meanwhile in the Sahelo-Sarahan region, grassroots efforts stand in contrast to top-down environmental management, are focused on applying certain methods in certain places, and are mindful of local contexts.

The importance of grassroots mobilization cannot be underestimated. This form of participatory action enables local knowledge of the land to complement the state's power of resource mobilization. We may glean from the two walls that indeed, acting on the precautionary principle and involving grassroots communities ties in with efficiency and frugality. This participation ensures at least two things: (1) state mandate matches local knowledge and proper tools and techniques are employed for a given context; and (2) members of communities are involved in the management and monitoring of trees. It takes a village to raise a child, or so the maxim goes; but given the proper empowerment and participation, it may also only take a village to grow and sustain a forest, and all the good that comes with it.

While they still need to be scaled and sped up, the mosaic of projects along the GGWSSI highlight vegetation as more than a product of a state's mandate stemming from a multilateral agreement, but as a common good which transcends national boundaries to address trans-national concerns. These concerns go beyond simply restoring fertile land and food and water security, but also include poverty, migration, gender equity, sustainable jobs, and climate resilience. These walls are about more than building barriers; they are about building enormous monuments to rival walls of hate and greed. They are monuments to sustained peace and celebrating cultural diversity in a world that seems to be increasingly polarized against that very thing. They are

testaments to a shared future. They are about building world wonders.

China can learn from the success in Africa: While both walls seek to address desertification, the nations which comprise the Pan-African Agency of the Great Green Wall place an emphasis on participatory action that goes beyond planting a sapling. Prudence in the form of precaution and a deeper understanding of the land and its conditions allow for proper identification of appropriate species to be planted and nurtured. On a micro scale, the ethics of care are made manifest in the caution of ensuring water infiltration. The close and meticulous management of communal gardens by local women allow them to appreciate a forward-looking vision of their communities' fates, working to ensure sustained food and water security, and ultimately empowering them within their respective societies and cultures.

Bibliography

Beiser, Vince. "China's Green Great Wall is on the Front Line of Its Fight Against Desertification, but is It Sustainable?" *South China Morning Post*, December 21, 2018. <https://www.msn.com/en-sg/news/other/chinas-green-great-wall-is-on-the-front-line-of-its-fight-against-desertification-but-is-it-sustainable/ar-BBR14qG>.

- Bilski, Andrew. "Africa's Great Green Wall: A Work in Progress." *Landscape News*, August 3, 2018. <https://news.globallandscapesforum.org/28687/africas-great-green-wall-a-work-in-progress/>.
- Bollier, David and Silke Helfrich, eds. "Can Commoners Become Self-aware of Their Collective Potential?" In *Patterns of Commoning*, 79–83. Massachusetts, Germany, Thailand: Common Strategies Group, 2015.
- . "Eight Points of Orientation for Commoning." In *Patterns of Commoning*, 72–73. Massachusetts, Germany, Thailand: Common Strategies Group, 2015.
- . "Patterns of Commoning: How We Can Bring About a Language of Commoning." In *Patterns of Commoning*, 44–69. Massachusetts, Germany, Thailand: Common Strategies Group, 2015.
- Bracken, Andrew, Evan Cunningham, Will Sadler, and Andreas Moe. "21st Century Desertification in China." YouTube video, 5:00. Posted by TuftsENVS on February 28, 2018. https://www.youtube.com/watch?v=3lJOQD4_neA.
- Cernea, Michael M. "User Groups as Producers in Participatory Afforestation Strategies." Washington, D.C.: The World Bank, 1989. <http://documents.worldbank.org/curated/en/742751468739271216/pdf/multi-page.pdf>.
- COMEST. "Ethical Principles for Climate Change: Adaptation and Mitigation Report of COMEST." Report adopted at the 9th Ordinary Session of COMEST, UNESCO Headquarters, 28 September–2 October 2015. <https://unesdoc.unesco.org/ark:/48223/pf0000234529>.
- . *The Precautionary Principle*. Paris: United Nations Educational, Scientific and Cultural Organization, March 2005. <https://unesdoc.unesco.org/ark:/48223/pf0000139578>.

- Environmental Education Media Project. “Loess Plateau Watershed Rehabilitation Project.” August 5, 2013. <http://eempc.org/loess-plateau-watershed-rehabilitation-project/>.
- Figueres, Christiana, Tom Rivett-Carnac, and Paul Dickinson. “All About EU with Miguel Arias Cañete.” *Outrage and Optimism*. Podcast audio, July 4, 2019. <http://outrageandoptimism.libsyn.com/11-all-about-eu-with-miguel-arias-caete>.
- Filipovic, Jill. “Will Africa’s Great Green Wall Discourage Migration to Europe?” *The Guardian*, July 19, 2017. <https://www.theguardian.com/global-development-professionals-network/2017/jul/19/will-africas-great-green-wall-discourage-migration-to-europe>.
- Finke, Anna. “China’s Great Green Wall Against Sandstorms.” June 16, 2017. <https://radiichina.com/chinas-great-green-wall-against-sandstorms/>.
- Great Green Wall. “Partners.” n.d. <https://www.greatgreenwall.org/partners>.
- “Great Green Wall.” *The Economist*, August 23, 2014. <https://www.economist.com/international/2014/08/23/great-green-wall>.
- Hardin, Garret. “The Tragedy of the Commons.” *Science* 162, no. 3859 (December 13, 1968): 1243–1248. http://www.geo.mtu.edu/~asmayer/rural_sustain/governance/Hardin%201968.pdf.
- Islam, Sk. Ahiul and Md. Mijanur Rahman. “Coastal Afforestation in Bangladesh to Combat Climate Change Induced Hazards.” *Journal of Science, Technology & Environment Informatics* 2, no. 1 (July 2015): 13–25.
- Laestadius, Lars. “Africa has Plans for a Great Green Wall: Why the Idea Needs a Rethink.” *Science Nordic*, February 8, 2018. <http://sciencenordic.com/africa-has-plans-great-green-wall-why-idea-needs-rethink>.

- Lao, David. "China is Building a Great Green Wall of Trees to Stop Desertification." February 19, 2016. <http://theplaidzebra.com/china-is-building-a-great-green-wall-of-trees-to-stop-desertification/>.
- Liu, Lei, Tong Wu, and Ziqianhong Wan. "EU-China relationship in a new era of global climate governance." *Asia Europe Journal* 17, no.2 (2019): 243–254.
- Morrison, Jim. "The 'Great Green Wall' Didn't Stop Desertification, but It Evolved Into Something That Might." *Smithsonian.com*, August 23, 2016. <https://www.smithsonianmag.com/science-nature/great-green-wall-stop-desertification-not-so-much-180960171/>.
- Muiruri, Alex. "Will the Great Green Wall of Africa Stop Endless Immigration to Europe?" April 9, 2018. <https://citizentruth.org/great-green-wall-of-africa/>.
- Petri, Alexandra E. "China's 'Great Green Wall' Fights Expanding Desert." April 21, 2017. <https://news.nationalgeographic.com/2017/04/china-great-green-wall-gobi-tengger-desertification/>.
- "Project for Combating Desertification in Inner Mongolia." YouTube video, 9:24. Posted by BrotherEarthJp on July 22, 2014. <https://www.youtube.com/watch?v=lxSTU4UtXw>.
- "The Great Green Wall." YouTube video, 5:59. Posted by Al Jazeera English on September 30, 2011. <https://www.youtube.com/watch?v=bdRDfXFjgZg>.
- "The Great Green Wall of Africa: Will It Help Fight Climate Change?" YouTube video, 8:36. Posted by BBC Newsnight on August 11, 2017. <https://www.youtube.com/watch?v=HVOYN70scS8>.
- "Trees for Water— China. Exploring Forest Landscape Restoration for Beijing." YouTube video, 7:42. Posted by IUCN, International Union for Conservation of Nature on March 10, 2015. <https://www.youtube.com/watch?v=CVwn0GkJvJl>.

United Nations Convention to Combat Desertification. “The Great Green Wall Initiative.” n.d. <https://www.unccd.int/actions/great-green-wall-initiative>.

Withgott, Jay and Matthew Laposata. “The Underpinnings of Agriculture.” *In Environment: The Science Behind the Stories*, 6th ed., 208–233. New York: Pearson, 2018.