

Chapter Two

The Case for Gender Equity

In Chapter One, I presented a female-centered approach to climate change programs at the community level in the Global South. Using an oral history collection and a theory of gender norms, I applied this approach to analyze the consequences of patriarchal social norms in India. To extend this analysis, in this chapter, I discuss the factors involved in reorienting gender roles: That is, once the gender equality climate change programs are in place, what must happen for women to maintain a sense of purpose in their roles within these climate change programs and in their public lives generally?

Toward this end, I first discuss the possibility of involving the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in supporting a long-term solution to female empowerment because UNESCO's mission is to "create cultural opportunities for human expression to uplift people and societies." At present, UNESCO does not redress the subordinate position that women occupy in most societies, particularly ones that are overtly patriarchal. Second, I analyze the benefits and limitations of the way current climate change programs address women's emotional, psychological, and intellectual needs. To accompany both of these discussions, below is a reference key to the international organizations and technical terms.¹ Finally, I use the *Bhungroo* irrigation model (introduced in Chapter One) as a transnational example of how projects in Kenya can increase women's sense of purpose and agency in India.

**Empowering Female Climate Change Activists in the Global South:
The Path Toward Environmental Social Justice, 19–41**



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Reference Key of International Organizations and Terms (in order of appearance in this chapter, with website links in Notes, pp. 163–164)

Names/Terms	Shorthand Descriptions
UNESCO (United Nations Educational, Scientific, and Cultural Organization) ²	An agency of the United Nations established in 1945 to promote the exchange of information, ideas, and culture
Sustainable Development Goals (SDGs) ³	Created in 2015 by the United Nations, it consists of 17 interlinked global goals to help achieve peace and prosperity for people (and the planet) by 2030
Department for Digital, Culture, Media, and Sport (DCMS) ⁴	Since 2011, it focuses on building a digital presence throughout the United Kingdom that includes broadcasting and the internet, and addresses policy aspects of entertainment, the arts, sports, etc.
World Heritage Sites ⁵	UNESCO-designated sites that have cultural, historical, or scientific value. It began in 1965 and currently includes over 1,000 sites around the world – mostly in Europe and North America
The United Kingdom Research Institute's Arts and Humanities Research Council ⁶	Since 1998, it supported research in such areas as languages and law, archaeology, English literature, design, and the performing arts
Theory of Change ⁷	Used by large organizations to plan, participate, and evaluate social change. The five components are: inputs, activities, outputs, outcomes, and impact
African World Heritage Fund ⁸	Launched in 2006 to work with UNESCO to support conservation and protection in Africa
Climate Heritage Network ⁹	Established in 2019, a voluntary mutual support network of government agencies, NGOs, universities, businesses, and other organizations committed to re-orienting climate change policy and planning
World Heritage Leadership (WHL) program ¹⁰	Works with IUCN and ICCROM (see these terms below) to set standards, provide resource materials, and establish learning networks between conservationists and cultural practitioners in communities around the world
International Union for the Conservation of Nature (IUCN) ¹¹	Created in 1948, a global authority on a science-led approach to data analysis and action. Consists of 1,400 member organizations and 15,000 scientific experts from over 160 countries. Climate change is one of eight major themes

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Names/Terms	Shorthand Descriptions
International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) ¹²	Also created after the Second World War, a worldwide interdisciplinary network to conserve and restore different types of cultural heritage. It offers courses and workshops to conserve museum, library, and archival collections
UNESCO's Culture & Sustainable Development ¹³	Integrates culture into national level public policies to, for example, reduce poverty and strengthen education for social justice. Develops tools to measure and monitor the impact of culture within the 17 SDGs
PRAXIS at the University of Leeds (United Kingdom) ¹⁴	An interdisciplinary project that aims to demonstrate the ways arts and humanities provide insight into global development challenges – “to capture and communicate arts and humanities research”
2030 Report (UNESCO) ¹⁵	Addresses five dimensions: people, prosperity, planet, partnership, and peace. Through 17 Sustainable Development Goals (SDGs), the report provides a blueprint to eliminate poverty, reduce inequality, and protect the planet by 2030
REDD+ ¹⁶	A program created by the United Nations' climate change conference (see UNFCCC below) that guides and implements activities in the forest sector to reduce emissions from deforestation in developing countries
United Nations Framework Convention for Climate Change (UNFCCC) ¹⁷	A multilateral environmental agreement originally drafted in Rio de Janeiro in 1992 to combat human interference with the climate system. Subsequently, it developed other treaties – the Kyoto Protocol, the Paris Agreement, and Intended Nationally Determined Contributions (INDCs). The annual climate change conference is referred to as the Conference of Parties (COP)
CARE ¹⁸	Established at the end of the Second World War, a large non-profit conglomerate that addresses food insecurity and poverty; presently focuses on women and girls
Coral Reef Rescue Initiative (CRRRI) ¹⁹	Led by the World Wildlife Fund and has many prominent supporters in conservation, science, and development (including CARE). Increases community resilience in coastal areas

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Names/Terms	Shorthand Descriptions
Capacity Building ²⁰	Defined in the United Nations as “the process of developing and strengthening the skills, instincts, abilities, processes, and resources that organizations and communities need to survive, adapt, and thrive in a fast-changing world”
Nationally Determined Contributions (NDCs) ²¹	A climate action plan to cut emissions and adapt to climate impacts. Each Party (member of the United Nations) to the Paris Agreement is required to establish an NDC and update it every five years
INDCs ²²	In 2015, the UNFCCC invited each Party (member of the United Nations) to provide to the secretariat a statement about how it plans to address climate change
Food and Agriculture Organization (FAO) ²³	A specialized agency of the United Nations to address food insecurity with 195 representatives (194 countries plus the European Union)
Climate Change Agriculture and Food Security (CAAFS) ²⁴	A trust fund donor research initiative focused on identifying climate-related threats to agriculture and food security and helping vulnerable rural communities adjust to global changes
Gender Action Plan (GAP) ²⁵	Established in 2014 through the Lima Work Plan on Gender to ensure equal participation and leadership throughout the UNFCCC: “Effective climate action must respect and promote gender equality and women’s rights”
Paris Agreement ²⁶	A United Nations agreement from 2015 that is a legally binding treaty on climate change. Its goal is to limit global warming by 2 degrees Celsius max, preferably to 1.5 degrees
Non-governmental organization (NGO) ²⁷	An organization that operates independently from any government – though it may receive funding from a government but operates without oversight or representation from that government

UNESCO, Climate Change, and Gender Equity

Established at the end of the Second World War in 1945, UNESCO’s mission was to facilitate collaboration and dialogue among nations. For over 75 years, it focused on preserving cultural heritage and, in 2010, added climate change to its areas of concern. Roughly 10 years later, in a 2021 symposium titled, “Heritage

and our Sustainable Future: Research, Practice, Policy, and Impact,”²⁸ UNESCO outlined its objectives as follows:

[...] As agreed in 2015 by the United Nations General Assembly, the 17 Sustainable Development Goals (SDGs) unite 193 Governments with the shared aim of leaving both our planet and societies on a sustainable footing for future generations. No poverty, clean energy, sustainable cities, and quality education are among the challenging targets that must be met no later than 2030. The pressure is on, and it's all hands-on deck with experts from across the globe rallying to this call. Since cultural heritage is an expression of human communities through diverse media, experts work to safeguard all manners of heritage: from vast buildings, works of art and folklore, to artefacts, language, and landscapes. The shared goal, however, is simple: to preserve the past so that future generations might enjoy, benefit, and learn from its legacy.²⁹

The problem in this articulation, however, is that the shared past is all too often patriarchal and subordinates and oppresses women as part of cultural heritage. So, to fulfill its goals, UNESCO must challenge and overcome those aspects of legacy culture. Documenting women's life experiences in climate-related crises, while not explicitly stated, is necessary to UNESCO's goal of preserving the past by enriching one's life through a variety of human expressions. One of its partners, the Department for Digital, Culture, Media, and Sport (DCMS), acknowledges past inconsistencies in measuring the benefits of cultural heritage – which it defines as “well-being, education, and identity” – and suggests correctives. In its activities, the DCMS notes that emigration and immigration, ruptures of family and community links, increased political dependence, and the inability to keep alive memories (including indigenous scientific knowledge) contribute to the loss of heritage. I suggest, and will make the case, that the above may be addressed by documenting women's expertise and life experiences.

Documenting women's experiences requires establishing trust between individuals and programs. One of UNESCO's project proposals seeks to build trust within communities by recording memories such as individual interviews, photos, and songs. The proposal specifies that collecting memories in such a way that they don't “retraumatize people” will enable UNESCO to (1) measure changes over time in individuals' emotional power and human connections and (2) satisfy two of the seventeen United Nation General Assembly's Sustainable Development Goals (SDGs) – sustainable cities and communities (# 11) and partnerships for the goals (# 17).

To measure the benefits of cultural programs and build trust, UNESCO is in the process of defining its “climate change” mission. In preserving sites of colonial heritages, it has been criticized for supporting cultural imperialism for at least 70 years, since the decolonization of Africa. (See the map below in [Fig. 2.](#)); however, this criticism takes on new meaning today in much the same way that the United States presently is reexamining its past glorification of

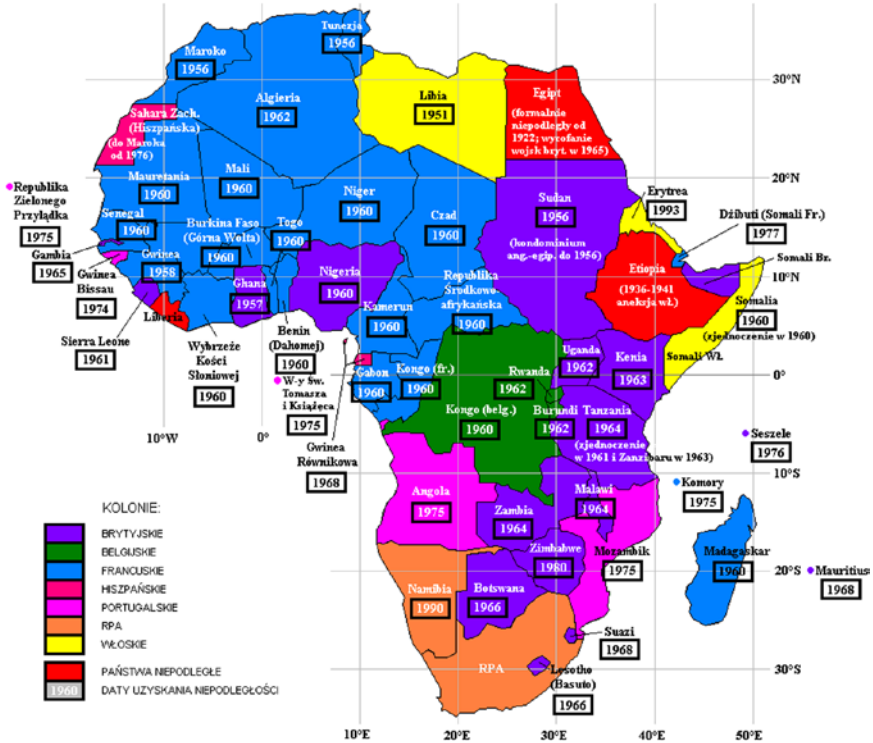


Fig. 2. Decolonization of Africa. “Decolonization of Africa” by Przemkol1 is licensed under CC-BY-SA-2.5,2.0,1.0.

slavery and conquering Native Americans through the presence of ubiquitous cultural symbols, including monuments, pejorative names of sports teams, names of buildings, and flags.

Today, UNESCO must face the reality that many, if not all, indigenous people suffer disproportionately from climate-related disasters.³⁰ In this respect, I believe institutions like UNESCO and others struggle to set aside their own assumptions about what victims of inequality need: These institutions should document “human civilization” with climate change in motion. For example, a profound question posed by Logan and Larsen in the UNESCO symposium was: “Are World Heritage Sites islands of nostalgia in the wider seas of environmental and cultural degradation?”³¹

The UK Research Institute’s Arts and Humanities Research Council initiative, also a UNESCO partner, foresees a way to merge (and transform) standard approaches to become more holistic – “by co-developing theories of change to understand user needs and using mixed methods with different voices and historical approaches in compiling oral histories and documentaries.” It refines UNESCO’s mission to include voices from those in “politically fragile countries” (quite a euphemism for countries torn by ethnic, religious, tribal, etc. conflicts) to increase the world’s understanding of environmental issues. This may involve

documenting women’s voices, although it may be difficult to gain access to rural women in local communities: Will “politically fragile countries” particularly in the near East and Africa set aside their existing cultural frames and patriarchies to allow this documentation to occur? In fact, many of the countries wherein UNESCO aims to orchestrate this change are burdened by political legacies of patriarchy that discounts women’s voices and power.

A further complicating factor is that UNESCO has a minimal investment in Africa for two reasons – one is poor management within the region and the other is the sheer number of environmental disasters. According to the African World Heritage Fund, Africa is the most underrepresented region in the world in terms of the numbers of UNESCO-designated World Heritage sites. There are approximately 1,150 world heritage sites but only 147 in Africa. See the map below (Fig. 3). The lack of such sites in Africa is astonishing and deeply disturbing. UNESCO has been able to meet the new SDG requirements in two ways – first, by establishing a Climate Heritage Network and, second, by supporting science museums and geoparks in the developed world, referred to as the Global North. In describing these initiatives – “to bring the power of arts, culture, and heritage to climate action” – UNESCO prioritizes five SDGs (i.e., good health and well-being (# 3); quality education (# 4); decent work and economic growth (# 8); industry, innovation, and infrastructure (# 9); and partnerships for the goals (# 17). Unfortunately, the reality is that all too often, the SDGs are a way for member organizations to “check a box” while continuing to perpetuate an unsustainable world under the guise of sustainability.

It is also true that UNESCO is in the process of updating its policies relating to science and culture. For example, it supports a World Heritage Leadership (WHL) program and other educational programs through the International Union for the Conservation of Nature (IUCN) and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) to “manage culture, nature and disasters.” As part of the IUCN’s World Heritage

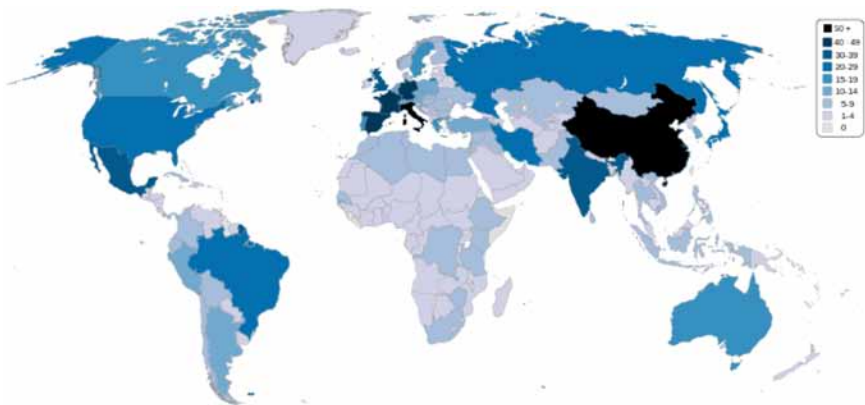


Fig. 3. Map of World Heritage Sites by Country. “World Heritage Sites by country gradient map (2018)” by Memnone di Rodi is licensed under CC-BY-SA-4.0.

network, it endorses a “holistic approach” and recognizes 100 resilience projects in 94 countries where climate change has become the most prominent threat. For example, its Culture for Sustainable Development initiative³² specifies that it aims to support local culture to rebuild a sense of community after disasters and during rebuilding; and cites projects in Haiti and Kashmir. UNESCO also champions a IUCN program that combines biodiversity, ecological integrity, and cultural heritage to develop a climate disaster management cycle to focus on “red zones,” primarily in South Asia.³³

In addition, in September 2021, in partnership with PRAXIS at the University of Leeds (United Kingdom) and with support from the Arts and Humanities Research Council (AHRC), UNESCO launched a series of brief reports, *Heritage and our Sustainable Future*, with case studies of community-based projects.³⁴ A contributor to one of the reports, Dr. Loredana Polezzi, has observed that a localized community approach presents differently than the approaches of international and national funding bodies.³⁵ Currently, each of the reports is a few pages long, which may be a result of UNESCO’s uncertainty concerning how to advance and integrate climate change into cultural heritage projects. Thus, it is not surprising that one symposium participant leveled the following withering criticism:

Why isn’t cultural heritage assessed in connection to zero hunger, affordable and clean energy, decent work, and economic growth? Why does culture require a tailored set of ethics? Maybe the current climate crisis cannot be assessed in light of culture? Culture cannot only be the pretty version of the past but also the terrible vision of the present – it must reflect who we are.³⁶

In examining the initiatives, UNESCO’s current presentation offers little acknowledgment of the status and roles of women in the Global South, many if not most of whom lack the freedom to make choices and/or articulate a sense of purpose under critical environmental conditions. Furthermore, it does not have in place policies that support women in the sustainable management of local resources, which is a key component of addressing climate change. Its *2030 Report* states that policies “will take into account the particular interests of women; for example, supporting cultural activities of particular interest to them.” This seems to me to be a vague and unhelpful formulation because it characterizes women as a “disadvantaged group,” and folds them into a general statement about equal opportunity:

Whenever possible, data collection is disaggregated by sex [and] cultural facilities cater equally to the needs of both men and women ... that the key determinants [of cultural practices] are the extent to which women and men are able to choose the lives they wish to lead, and to contribute to and benefit from their country’s cultural, political, economic, and social development.³⁷

To move toward a female-centered approach (discussed in Chapter One), in this chapter, I suggest that UNESCO develop policies to allow for the collection of in-depth oral histories and memories about rural women's life experiences. If it does so within the context of climate change initiatives, this type of documentation could provide much needed legitimacy to women's authority in demonstrating that their lives matter, as does the land upon which they live, both of which have changed dramatically due to environmental disasters.

Oral histories from women in the Global South could enrich transnational advocacy networks, which are essential to accessing financial resources to address climate crises and women's agency. UNESCO must redirect its resources to support oral history projects especially in places where women, and whole communities, have been forgotten. At this point in time, women often are tied to the land but everything else is changing. Many men have migrated away from home to find work elsewhere and climate-related disasters continue to ruin those who are left behind. Here, I suggest that urban areas are stressed because of male out-migration from rural settings and that, at some point, we (as a collective) could learn from the experiences of women who have acquired climate change adaptation strategies as the primary caretakers of family and resources in rural settings.

A sense of purpose needs to be acknowledged as an important part of rural women's lives. By becoming devoted to work outside of themselves (as part of documenting climate change through oral histories), women may become energized because they are utilizing their expertise to help others solve problems. New research by psychologist Scott Barry Kaufman expands upon Abraham Maslow's well-known hierarchy of needs theory to demonstrate that purpose is an essential human need as well as a major source of meaning in our lives; and that self-actualization can be integrated into other basic needs.³⁸ Thus, the need for food security may exist alongside the need for self-actualization. One of my students at Stony Brook University, Yasmeeen Watad, disagrees with this formulation, as many readers may as well: "The idea that the need for food and self-actualization may exist side-by-side seems counterintuitive."³⁹ And yet, "survival" can include gaining great satisfaction from helping family members by speaking out, to let others know about their situation. Kaufman's point is that we are accustomed to thinking linearly – working up a ladder – when, in fact, survival is multilayered and interconnected. Rural women may be energized and feel empowered by participating in projects that help others understand how they have adapted to the reality of climate change.

Results from Field Studies

Current assessments of formal, institutional programs that aim to address women's sense of purpose in the most vulnerable areas of Africa and Asia suggest that the programs do not seem to provide a clear path forward. One comparative study of 20 UNFCCC forest loss programs, REDD+,⁴⁰

demonstrates that, despite its intentions, the programs have not addressed gender differences: Disadvantaged women do not have a stable agricultural income, still need more government services, and seek greater opportunities to save money. To improve their well-being and self-worth, women expressed a desire for “conditional livelihood enhancements,” such as being paid for the work that they do to improve the environment. The study also identified some contextual roadblocks: In Vietnam, women do not take on leadership roles or become involved in working groups; in Burkina Faso, the REDD+ programs perpetuate a gendered division of labor; and, in Nepal, despite attempts to include women, gender imbalances persisted.

As a result of these findings, researchers concluded that the planning and implementation of REDD+ programs need a complete reboot.⁴¹ Another assessment that focused on a REDD+ pilot program in Nepal, which had received substantial support from the German Federal Ministry for the Environment along with other NGOs, had similar recommendations for improvement. These researchers noted that, to feel a sense of purpose, women had to have greater control over assets and be represented at all decision-making levels (i.e., not just at the local level) to safeguard their own rights.⁴²

Others who analyzed projects affiliated with the UNFCCC, CARE, the World Wildlife Fund (WWF), and REDD+, agree that international programs fail because the programs emphasize women’s vulnerabilities instead of recognizing their potential contributions to local environmental and ethnobotanical knowledge. For example, the Coral Reef Rescue Initiative (CRR) – which has projects in Fiji, the Solomon Islands, Madagascar, the Philippines, and Tanzania – often do not give women a sense of purpose, including education, provisions for alternative livelihoods, increased participation in decision making, and addressing gender-based violence.⁴³ As “gender transformative” as these programs purport to be, most of the programs appear to be “gender accommodative” because existing gender norms within the societies women live restrict their options. To help change this situation, field experts recommend combining management, conservation, and adaptive capacity building.

Another insight comes from a CARE-sponsored program in Cuba, where women previously were unaware of the effects of the existing patriarchy on their ability to work alongside (rather than under) men and get paid for their work. The CARE program provided training using solid domestic and agricultural waste as climate change adaptation tools to cultivate fruits, vegetables, sugar cane, and livestock.⁴⁴ The question, addressed in this chapter, is whether women will continue to feel valued and be able to decide how they will use the money they earn. In other words, when the CARE program ends, will women have established a sense of purpose and commitment that will sustain them over the long term?

Another body of research published in 2018 by a group of eighteen researchers analyzed qualitative data gathered from interviews with women conservation leaders in seven Asian Pacific countries to determine best practices for

incorporating women into climate change adaptation policies.⁴⁵ This study indicated that traditional oral communication – where women passed down to their children survival techniques during droughts, including planting practices – weakened as climate change events increased and they were compelled to work longer hours in the fields while male family members traveled to other, larger farms to work as contract laborers. Women gained self-esteem and a sense of purpose when they were integrated into the decision-making policy process because, as is the case in many agricultural communities, they had greater knowledge of the land and the innovative capacity to modify existing practices to adapt to climate change. This study recommended enhancing women's sense of purpose by incorporating women's organizations into formal policy and decision-making processes at local levels.

An article published two years later in *Gender & Development* stated that most UNFCCC programs still characterize women as victims of climate change and passive recipients of aid.⁴⁶ Furthermore, in comparing official statements from individual countries' nationally determined contributions (NDCs) to their previous *intended* nationally determined contributions (INDCs), the report mentioned that there was only a slight increase in national commitments to gender equality;⁴⁷ and provided examples of member states (e.g., Uganda, Tanzania, and Nepal) that are coordinating climate committees across governmental departments and including women in national ministries and national organizations. Noting the high degree of complexity involved in enacting national-level gender equity and climate justice policies at local levels, the study also highlighted a training program in Guatemala (which has roughly half the population of Nepal and a third of the population of both Tanzania and Uganda) that involved 22 governmental organizations and NGOs at national and local levels.⁴⁸

One can imagine the large number of organizations that will be involved in implementing gender equity policies in large agriculture-based economies that are continually threatened by climate-related disasters. This suggests that the mostly male-run governments pay lip service to gender equality and women's participation and empowerment because those are the goals articulated by United Nations' agencies or other external actors. And even the agencies working on site may lack much, if any, commitment to such goals.

Another field study examined United Nations programs through the Food and Agriculture Organization (FAO) in Africa and highlighted the success of gender-based training in Uganda and Tanzania; and the financial incentives provided through a Climate Change Agriculture and Food Security (CCAFS) program in Kenya and Nigeria.⁴⁹ The report concluded that climate change adaptation programs at grassroots levels had the greatest impact on women's self-esteem. However, to date, no follow up impact report has been issued to verify these conclusions.⁵⁰ A literature review of 25 qualitative case studies across Asia and Africa published in 2019 revealed that environmental stressors (including but not limited to rainfall variability, temperature extremes, and water scarcity) tend to negate women's agency.⁵¹ The review stated that, in order to satisfy the requirements of the

UNFCCC's Gender Action Plan, the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, and the United Nations' SDGs (please refer to the reference key at the beginning of this chapter for brief descriptions of these agreements), common conditions such as male migration and women's poor working conditions combined with institutional failure or poverty must be addressed to expand women's agency.

These findings deliver the same message as a field study that analyzed the efficacy of gender responsive climate change measures in Sub-Saharan Africa.⁵² The four countries in that study – Mali, Nigeria, Rwanda, and South Africa – confirmed that although women were entirely capable of participating in climate adaptation strategies, they were not encouraged to become involved. In Mali and Nigeria, women were marginalized because they had no access to land rights or control over financial resources. In Rwanda, while 64% of lawmakers and 50% of the Cabinet were women, at the local levels, women could neither own land nor become financially independent. This suggests a significant disconnect between a relatively modernized and probably urban elite of educated women and their undereducated and overworked rural sisters bound by patriarchal cultural practices and legal norms, including the absence of property rights. In South Africa, women served as Parliamentarians but were excluded from most energy-related decisions. In essence, this study asserted that, to be successful, climate policy must be both “top-down and bottom-up.”

In fact, the above field studies strongly suggest that if women could own land or have their own money, they would naturally acquire agency in financial and decision-making power. But Jeannette Gurung's conditions under which women become leaders, presented in Chapter One, reflect a much more nuanced picture of women's potential. She recognizes that women's self-actualization is an integral part of world betterment with respect to the issue of climate change. In fact, the *Bhungroo* program, also introduced in Chapter One, integrates these two elements – self-actualization and world betterment – into women's empowerment by connecting with women around the world. Biplab Paul, co-founder of *Bhungroo* states:

I need documentation support and talking support. Through social media, I can talk to people sitting in the USA about my work. I don't need money from anyone. We need to identify good potential [for the *Bhungroo* program] in any part of the world for other woman climate leaders We have just been doing some work in Africa, too.

He notes that it is important to connect with women outside of the immediate context. For example, could it be the case that the most highly motivated, intelligent, and energetic women tend to leave the rural villages for towns for employment and career opportunities outside their immediate natal place, leaving their sisters in place in the villages? Also, does women's birth order figure into the

equation, for example, in families with multiple girls, who gets educated, who stays home, who gets married, etc.? To better understand how this is accomplished, the following section takes a deeper look into the *Bhungroo* program, to understand how this program was created; what the founders did to elicit government support; why their institutional learning was not linear; and how this program is used outside of India. I also discuss how outside support was crucial to the program's success not only in terms of empowering women in India but also in addressing the types of expertise needed to transfer technical and cultural knowledge to other countries and regions.

The *Bhungroo* Story

As a young woman from an urban, middle-class family, Trupti Jain was 22 years old when she first visited rural Gujarat. Three years earlier, she had graduated from college with a degree in environmental engineering and joined an NGO to do research on the economic impact of the environment. She then began to work for the state government of Gujarat in India and, within two decades, rose to a position in which she headed up national programs and managed a staff of between 70 and 180 people. She explained:

I learned through that [job] the quality of the staff and how it is working is most important. I wasn't trained to be in management. I had to learn how to work with my team members and collaborate with those at the upper levels.

As part of her work, she became interested in improving women's living conditions as she traveled through the region and witnessed the effects of all the unpaid work that women did outside of the home. She found that fully 86% of the activities to maintain the farm were done only by women while men migrated to other, larger farms to find work. After carefully observing their work activities, she decided to incorporate women's activities as part of environmental management – to make their activities sustainable. She believed that women had to become empowered not only in Gujarat but also in other Indian states; and that, if women could get economic power, they would regain their dignity. *Economic power equates to power within the family as well as outside it and nourishes women's agency rather than dependence.*

Throughout her government career, Jain learned that at both upper and lower levels of management – at state or local levels – acceptance of women occupying positions of authority must be cultivated. This same struggle takes place in American academic institutions, government agencies, corporations, and everywhere else, a struggle that is ongoing in the face of entrenched old boy networks. In her position, she was not easily accepted because she was a woman. She elaborated as follows:

I must put in extra effort for it. My life is easier now that I don't get angry. I was frustrated because I have the same capacity, educational degree, and so on.

Jain also discovered that she could not gain support from other women, even in her government position. (Sisterhood is supposed to be powerful but, in my experience, doesn't always operate in real world settings.) She also realized how women were treated at the local levels in the Penjyad. Jain stated:

Our many women have been in contested elections at the local Penjyad (the village governing body) in the village of Mehtan. In India, in 1992, the 70th Amendment was passed in the constitution of India. So now the 70th Amendment is saying that at least 33% of the seats for the Penjyad are reserved for women only. What was happening was that the dummy candidates had been put on the Penjyad because men don't know that the seats were reserved for women; and, even if they did know, they don't know how to work it out and make the decisions. So, in the name of the women, only men were always working in the Penjyad.

Even though she had no experience in how to run a business, Jain decided to leave her government position and the political realm to establish a social enterprise. As she and her husband, Biplob Paul, formed Naireeta Services, they soon realized that they still had to work with governmental institutions to receive endorsements in many different regions. Jain knew that it was important to have a supportive male spouse (or father or brother) in facilitating women's acceptance into leadership positions in a male-dominated world. Men can (and do) act as brokers or intermediaries in figuratively opening doors to women as women seek to enter previously male domains of work and power.

By cultivating relationships, *Bhungroo* became officially recognized under the "National Rural Livelihood Government Program," in which every state in India can have an allocated budget to use the *Bhungroo* irrigation technology. In fact, some state governments – in particular, Uttar Pradesh, Andhra Pradesh, and Bihar – gained primary authority to institute programs. In essence, Jain's experience in the government – and acceptance that she needed her husband to gain acceptance – resulted in the *Bhungroo* irrigation project becoming a pilot for the government allocation of funds.

While Jain herself knew that women farmers also could be entrepreneurs, she recognized that farming sectors dominated by men usually don't acknowledge women's deep agricultural knowledge: "Women have years and years of experience, but people don't recognize it, not in terms of money and not in terms of appreciation." Thus, in pitching the program to farmers, Jain and Paul emphasized the fact that families could regain a sense of dignity, self-worth, and independence by working their own land and not having to work on other, wealthier, farms. In fact, once Naireeta Services implemented the *Bhungroo* irrigation system on their own land, farmers tripled their incomes.

In farming villages in Gujarat, Jain focused on giving equal opportunities to any woman who wanted to become a “climate leader” and would be effective in “selling” their knowledge to other local farmers. Naireeta Services pays women to learn about the irrigation technology products, including the price structures, methodologies, and applications – for drip irrigation, fertilizer application, seed selection, and so on. Their role is key because farmers must deal with lots of problems like cropping patterns and watering cycles and, while there are consultation services in the cities, small/poor farmers cannot afford them. At the local level in farming communities, she found that much of her work involved convincing women that they could learn the technical and planning aspect of *Bhungroo*. “No one has entrusted them in so many years. We had to go to the male farmers and ask them to convince the women.” In the farming villages, she focused on cultivating women leaders by incorporating female staff and giving them leadership positions. Jain further added:

I am trying to develop their capacities. Women have leadership qualities. Women must have self-respect and self-dignity. The second thing is that as a woman leader, I must make sure that I address the stakeholders and point out that they can learn from this (with women as leaders). It is hard, but we need to both understand it and project it in the right platform.

This suggests that forming women centered and women-led local organizations as parallel structures to existing male led ones may be one effective means of catalyzing rural change, including with respect to climate change. However, this may also elicit a patriarchal backlash among men who feel threatened by the emergence of non-subservient women. This is like racial and gender politics elsewhere, including countries in the Global North.

As she began to implement the program, Jain didn’t know whether local women would support her and was surprised when they did: “They enhanced my knowledge and gave me moral support when I got frustrated.” Furthermore, as *Bhungroo* and Naireeta Services became recognized internationally, Jain found a common purpose with others, including one Indian woman, who was a deputy director at the United Nations and had struggled for recognition. Jain was encouraged by many international feminist environmental leaders like Madhu Kishwar and Vana Sival, Sunita Narayal, and even her former boss, Rita A. Teotia, who, after Jain left her government position, became the secretary of commerce and industry.

At the core of the *Bhungroo* program was a clear acknowledgment that Naireeta Services could not change the land rights system in India. They had to look for another way to help women farmers gain power over their lives. Jain described her challenges as follows:

Within the government, I fought a lot. But I did not take an activist approach. In this position, I did a lot to try to give the land rights to the women because only 3% of women have land rights in our state [Gujarat]. Because they don’t have the land rights,

they must put up with a lot of domestic violence. They don't have anywhere to go and there is a lot of domestic violence. I couldn't change the government structure either. I thought that if I want to do something for the women, I had to be part of the government. But I realized that trying to change policies doesn't change things at the grass roots level. So why not devote time to *Bhungroo* to get irrigation water? We wanted the water rights to go to the women. If they did not have land rights, then why not give water rights to these women?

Again, this suggests the value of establishing a parallel power structure to the existing one. *Land is power, water is power*. Naireeta Services was the institutional mechanism Jain and Paul used to promote the *Bhungroo* program. One major challenge was that the state government assumed that they would be available, free-of-charge, to promote the project. The reality was that dealing with government bureaucracy required enormous time and energy, including making presentations and shadowing the trail of paperwork that required official Memoranda of Understanding (MOUs). At the same time, they experienced difficulties in overseeing the installation and maintenance of the irrigation technology in the field: While the state government allowed for the construction of 3,000 *Bhungroo* irrigation units, it turned out, as one might expect, that some units did not work for various reasons. Therefore, they needed people outside of the village structure to regularly monitor and oversee the units.

Initially, Jain and Paul didn't plan to establish a social enterprise.⁵³ Because Jain had worked for two decades in Gujarat implementing development programs for the national government and Paul had worked on accounting procedures for a local NGO, they did not know what it would take to establish a profit-making institution in the form of a social enterprise. At the same time, while they were establishing Naireeta Services, they became somewhat overwhelmed by the international awards they received (including an award in 2007 through the UNFCCC), and extensive media attention all over India that highlighted the way *Bhungroo* supported local communities.

They soon realized that they needed a steady flow of funds to sustain the program. It took four years to identify the best legal structure – to replicate, scale it up throughout India, and register it. It was challenging to identify the right legal structure to register as a social enterprise. They didn't know what kind of taxes they would need to pay or how to calculate startup costs; and tax and accounting liabilities initially were quite difficult to understand. They began to receive support in the form of mentorship from a variety of organizations, including the Indian Institute of Management in Ahmedabad, which has an information management program, and faculty members from Stanford University in California about legal liabilities and debts. Also, the Ashoka network, where Paul had received a fellowship, helped them understand the benefits of social enterprises.

In the meantime, farmers from other regions who were having problems irrigating their land asked Paul to help them combine his knowledge of hydrology with their traditional knowledge of the land. It took six or seven years of trial and

error before they came up with several different versions of the *Bhungroo* technology. [Presently there are 13 different versions.] According to Jain, “Now, the publicity is by word-of-mouth so that we get a key tool for marketing from that.” In addition to local farmer interest, outside organizations provided monetary support and more publicity, including the World Bank’s Department of Science and Technology,⁵⁴ which enabled them to form partnerships outside of India. As Jain described it: “We had never planned to work in Vietnam or Ghana, but the partners approached us, and we eventually got the right partners to help us.”

In addressing all the parts of how to work through government channels, address farmers’ needs, empower women, and gain support from outside of India, Jain and Paul were under a lot of pressure: An idea that began as a small endeavor was rapidly expanding. Still these additional interactions provided new motivation to have an impact in adapting to climate change disasters. For example, Jain’s and Paul’s in-country experiences with local and national government institutions enabled them to appreciate the intricacies of project management in other countries. In addition, they realized that the only way for women to sustain a sense of purpose within their families and communities is if the institutional channels were structured correctly.

The Possibility of *Bhungroo* in Turkana County, Kenya

Jain and Paul realized what many environmental sociologists have long noted – that the dangers of climate change are a reality in many areas of the world, especially in Asia and Africa (Barros et al., 2014); and that high temperatures, inconsistent precipitation, extreme weather events, and the rise of sea levels continue to displace and destroy the livelihoods of millions of people (McMichael et al., 2008). In their work, they observed firsthand what others have documented throughout the Global South – that populations are faced with food insecurity and unstable agricultural jobs (Kumar & Gautam, 2014). Jain and Paul had joined many international and local organizations to propose strategies for assisting vulnerable nations with limited resources under the rubric of climate change adaptation. Central to these programs was “gender mainstreaming” that involves both women and men in decision making (Aguilar et al., 2015). The combination of gender mainstreaming and climate change adaptation programs aimed to benefit both women and the natural environment (Palanisami, 2016). In addition, intergenerational mainstreaming – to involve older and younger generations – might result in long-term success of the projects. However, the problem that Jain and Paul were attempting to solve is whether such initiatives could increase the leadership and social status of local women in farming communities around the world.

I became especially interested in how *Bhungroo* could be used in other countries in the fall of 2019 when an eminent anthropologist and faculty member from the Turkana Basin Institute (TBI) in Kenya, Richard Leakey, met with a group of faculty members at Stony Brook University to hear more about their ideas and research plans. He became excited about my description of *Bhungroo* and the prospect of implementing it in the Turkana Basin region of East Africa. Apparently, the region has tried many water -filtration programs with very little

long-term success. According to another colleague who worked in the region for several years, Kamazima Lwiza, the men of Turkana County would not let the women be in a position of power. He stated: "Women have no power. It is a male-dominated society. Widows are married/inherited by the husband's brothers or paternal cousins."⁵⁵ There is also the factor of intertribal fights, and it is not clear whether *Bhungroo* would raise or ease those tensions.

Turkana County has an arid climate with little and undependable rainfall. Given that climate, agricultural production is not feasible on a large scale and most people who live in the basin are pastoralists. Most of the rain comes in April (approximately 50 mm), but very little comes in September (approximately 2 mm). While there is a large lake in the area, its water is alkaline and unusable. River water is one of the only sources of water for the over 50,000 km² that make up the area. A few of the pastoralists who do own land grow subsistence-based crops such as corn, cotton, okra, sorghum, and cowpeas. According to Lwiza, "[the farmers] usually have very small plots, in most cases an acre or less, but some go to 5 acres." Water scarcity dissuades residents from depending on farming, which is one of the reasons farmers comprise only a small portion of the population and pastoralists dominate.

Ever since the devastating 1973 drought, pastoralism has been characterized by a life of poverty and dependence due to an increasing process of proletarianization in the countryside (Hogg, 1986). Pastoralists are losing herding lands to farmers, ranchers, game parks, and urban growth (Fratkin & Elliot, 2001). This loss and resulting tensions of land use and access is magnified by "increased commoditization of the livestock economy, out-migration by poor pastoralists, and dislocations brought about by drought, famine, and civil war" (Fratkin & Elliot, 2001). As the Kenyan government pushes for privatization and individuation through international government programs, these problems intensify.

The utilization of *Bhungroo* technology could be beneficial in the Turkana Basin in two ways. First, it would help farmers, who are predominantly women, irrigate their land and, second, it would provide a stable water source for pastoralists, all of whom are men, and their livestock. Because *Bhungroo* is tailored to farming communities that need the technology for irrigation, it can be installed "as is" for their farmers. While the Kenyan government has tried teaching irrigation methods in the area since its colonial days, these initiatives have failed because of cost and lack of local support. Furthermore, those interventions prescribed solutions to pastoralists and farmers alike, "without involving the recipients they intended to serve" (Akabwai, 1992).

Because of the stress it would cause to social cohesion, and the community overall, it is not practical to consider the possibility of converting a pastoral community into a farming community. Instead, the *Bhungroo* technology would be adapted to suit the needs of a predominantly pastoralist society. For example, the *Bhungroo* technology could be implemented as a water filtration tank rather than as an irrigation system reservoir. This would allow the technology to adapt to the pastoralist lifestyle and provide a steady water source for families and livestock. The water tank may need to be modified with a better filtration system as the primary use of this would be drinking water. This would improve the quality

of life for the pastoralists. They could also trade or sell the water. This would help counter the notion that, “poverty and dependence is becoming a permanent way to life to many pastoralists” (Hogg, 1986). By having their own water source for the community, the pastoralists would become independent from “cowboys” (i.e., white Kenyan ranchers who consider themselves racially superior) and town-based elite to whom they are currently subordinate. They would also have healthier livestock, improving their price and the owner’s income, and they could trade or sell the water itself, thus enhancing their economic resilience and alleviating their poverty. Although I recognize that this specific idea is novel, it could be extremely beneficial to the pastoralists of Turkana County.

In times of water scarcity, villagers in Turkana County would come to the women who are official leaders. Training women to manage the *Bhungroo* irrigation technology would increase their income as the water could be bartered for a share of crop, as most of these villages are bartering communities. This also earns them dignity and respect in the agricultural community and the village. Although the land women cultivate is in the name of their husband/brother/father-in-law, the women themselves gain credibility and become significant: The village understands that these women are sometimes the only means of water. For this reason, men listen to women’s concerns and consider their opinions in decisions, where they would disregard them before. Women can use this to voice their opinions on the health hazards they endure due to climate change.

While the COVID pandemic restricted our ability to move forward on this project, at Stony Brook University in New York and at the TBI in Nairobi, Kenya, on a positive note, we had the time to form a cross-national team to develop a pilot study that is rooted in *Bhungroo*, and another UNFCCC-recognized program, the W+™ Standard, which was developed to pay women for using environmentally friendly technologies.⁵⁶ Several elements of our proposed pilot study are useful for illustrating how rural women in Turkana County could lead in improving the water, food, and income security conditions of their families; and demonstrating that climate change adaptation must be addressed through transnational initiatives.

In developing the plan for our pilot study, we noted that environmentalists already had determined the dire consequences of climate change for populations in India: Shifting rainfall patterns, increased rates of evaporation, and population growth are projected to result in an additional 1–4 billion individuals being exposed to drought by the end of the century (Watts et al., 2017). Accordingly, we cited a 2015 World Bank study, which estimated that 62% of urban communities while only 28% of rural communities have access to improved sanitation (World Bank Group, 2018a). To bring the point home to Turkana County, we made the point that, in general, women in rural areas are disproportionately vulnerable to contracting water-borne diseases: Traditionally, they provide water for the family; and this role is particularly hazardous when a woman is pregnant or menstruating, as an increased standard of hygiene is necessary at that time, especially because women are then more susceptible to diseases (Birch et al., 2012). When water is scarce, as is the case in the Turkana Basin region, WHO estimates that at least 30% of a woman’s daily energy is spent on harvesting water (WHO, 2014), which is another reason for extending access to water. Moreover, the manual labor involved

in harvesting water can cause chronic skeletal pain from repeated damage to the neck and spine. This is exacerbated when, as is the case in some Indian states as well as in parts of Kenya, women need to travel long distances to obtain the water. This activity increases exposure to heat stress and heat stroke and increases women's exposure to violent crimes (Jalees, 2005).

We presented the *Bhungroo* program as a solution to water scarcity and sanitation issues, since *Bhungroo*'s irrigation technology filters, injects, and stores excess farm water or storm water underground for usage in lean periods. This is ideal for the Turkana region where rainfall is increasingly unpredictable, as up to 4 million liters of water can be stored during the monsoon season when there is excessive rainfall. The rainwater can then be saved for the drought season. (See the map below in Fig. 4.) Using *Bhungroo*, water stored from excessive rainfall allows farmland to become more arable and fertile during the dry season. While the *Bhungroo* irrigation technology is an investment, without additional funding on-site, the installation price may be unattainable for many farmers in the Turkana region.

With this revelation, I worked with a student at Stony Brook University, Kunika Chahal, to develop a proposal for integrating a financial incentive system for local women – the W+™ Standard.⁵⁷ The W+™ Standard endorses projects by women that create and increase social and economic benefits for women participating in economic development or environment projects, including those that provide renewable energy technologies, time and labor-saving devices, forest and agriculture activities, and employment opportunities. (Gurung, 2020)

These endorsements are sponsored by companies from around the world who are looking to combat climate change. The cost per W+ unit (which is the minimum donation) varies per project, as each project has a different cost for implementation; however, for current projects, it amounts to approximately three U.S. dollars (WOCAN, 2019). This financial arrangement gives local women both the resources they need to combat climate change and the capital to make a sustainable, long-lasting difference. In this program, women's empowerment is measured by the W+™ Standard in six domains: time, income and assets, health, leadership, education and knowledge, and food security.⁵⁸

In talking with Jain and Paul, we realized that, while women could be trained and gain credibility within their communities, there was no mechanism for giving them financial incentives to sustain them over the long term. In fact, in the many “gender mainstreaming” international development programs that have been attempted over several years, it turned out that, because of social norms, women were unable to achieve a sense of purpose.⁵⁹ This is the reason Kunika and I integrated the W+™ Standard into the *Bhungroo* program because once the initial investment is made – even for a few years – and the technology is transferred outside of India, there needs to be a way to enhance women's credibility in their communities.

As discussed earlier in this chapter, it seems reasonable, as Scott Barry Kaufman's research on Maslow's hierarchy of needs theory suggests, that the need for “purpose” exists alongside other basic needs. As one of my students, Erin Byers, commented, “What better time to find purpose than helping to solve a global climate crisis, right?”⁶⁰ That is, women's self-actualization can be integrated into



Fig. 4. Map of the Proposed *Bhungroo* Site in Turkana County. Influence of Enclosure Management Systems on Rangeland Rehabilitation in Chepareria, West Pokot County, Kenya – Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/West-Pokot-County-Livelihood-Zones-Source-Adapted-from-the-National-Drought-Management_fig1_285131644 [accessed November 7, 2022].

other basic needs of food security, health and well-being, and financial independence; and that women can be energized when they are part of a project that extends beyond their immediate environment. For example, it is valuable for women to share experiences internationally in other countries where similar problems exist to show how they have adapted to the reality of climate change. That is why the initial investment in the *Bhungroo* program cannot stand alone.⁶¹ While the *Bhungroo* irrigation technology empowers women by teaching them how to farm their own land, the W+™ Standard is necessary to work around

the patriarchy by endorsing projects by women that, according to the WOCAN's founder, Jeannette Gurung, "creates and increases social and economic benefits for women participating in economic development or environment projects."

My colleagues in Kenya determined that the best way to introduce *Bhungroo* was to carry out a baseline survey – to interview women farmers, their husbands, town officials, and other key informants – to determine individual members' knowledge, attitudes, and practices and the community's understanding of the technology and the irrigation process, together with other systems of water use.⁶² They identified gender differences and the need for a husband and wife "team" to reach a similar understanding of the project. In short, they implement two criteria: First, husbands must support wives and, second, town officials cannot loot the families. These experts intended to focus on capacity-building in the two communities in West Pokot in Turkana County. (See the map in Fig. 4 above.)

While increasing temperatures, decreased air quality, and water scarcity are debilitating problems for all, the common thread for women who undergo the effects of climate change is experiencing pregnancy complications and negative cardiopulmonary health. They are at increased risk for water-borne diseases. Scientific studies indicate that "poverty, gender inequality, insecure land rights, heavy reliance on agriculture, less access to education and information are among the principal reasons for their [women's] vulnerability to climate change" (Yadev & Lal, 2018).

Conclusion

The project in West Pokot, which would commence as a pilot study, was to determine the extent to which the *Bhungroo* technology – as a water storage system that can only be owned by women and is primarily for irrigation purposes for water-stricken areas – will improve water security, food security, and income security for women with the goal of improving poverty and resilience of the communities that are using this technology. Below is a summary of the "team" that we determined would be needed to implement this policy to ensure long-term sustainability:

Transnational (and translational) advocates: (a) a non-partisan expert to conduct field interviews with farmers to identify community dynamics and needs; (b) an expert in water resource engineering in rural communities; and (c) an expert in gaining support from international development organizations such as OXFAM, USAID, World Bank, and even national and international professional environmental organizations.

In-country actors: (a) an expert to form consortiums with local and foreign institutions around food agriculture nutrition, energy, the environment, and water; (b) an expert to train local farmers to utilize technology; (c) a cultural informant on gender and youth activities in rural communities; (d) an expert to monitor and

evaluate natural resource programs; (e) an expert in developing budgets and implementing timelines; (f) an expert who works with county, state, and national government agencies; (g) an expert in professional mentorship; and (h) an expert to develop the conceptual and practical framework for the project – based in country (connecting experts).

In sum, inching toward social change that promotes women’s empowerment – which is required in the Turkana Basin to introduce and sustain an irrigation technology – requires different levels of expertise.