

GENDER-RESPONSIVE LAND DEGRADATION NEUTRALITY

Atieno Mboya Samandari¹

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1. INTRODUCTION

Land is a vital resource for producing food and other ecosystem goods and services. Ecosystem services include biodiversity conservation, regulation of hydrological regimes, cycling soil nutrients and storing carbon, among others. Productive land is the most significant geo-resource, or natural capital asset, that human beings possess; human subsistence depends on it. In the case of communities that rely on land as their primary asset, their survival and the sustainability of their livelihoods are completely dependent upon, and intricately linked to, the health and productivity of their land.² In these mostly rural communities, food production is undertaken primarily by women, with output dependent on the fertility of the land.³

This paper will discuss emerging trends in gender dimensions of land degradation, making an argument for the importance of taking gender roles into account when making policies and laws to promote land degradation neutrality. Women comprise 43% of the world's agricultural labor force, rising to 70% in some countries.⁴ In Africa, for instance, 80% of agricultural production comes from small-holder farmers, who are mostly rural women.⁵ Despite their majority in the small-holder agricultural sector, women typically don't have secure control over their farmland or over its productive resources, especially commercially marketable produce.⁶ This lack of control is linked to land ownership rights in rural areas, which habitually favor men; women's access to the land, meanwhile, is mediated by their relationship to the male owner. Such arrangements are rooted in the traditional patriarchal norms of granting ownership over society's productive resources.

As stewards of natural resources, rural women farmers find themselves at the forefront of those impacted by land degradation. As such, gender-responsive land degradation neutrality policies become an imperative at the local, national, regional and global levels. Climate change is a compounding factor in land degradation that increases uncertainty with regard to women's production, accessibility and utilization of food, as well as in relation to food systems stability.⁷ Environmental change, of which land degradation is a part, has differentiated impacts on women and girls, as well as on men and boys, making gender an appropriate way to examine the relationship between land degradation and equality of the sexes.⁸ Law plays a crucial role in mandating equality between women and men, and paves the way for the state to enforce responses to changing gender roles that would promote the empowerment of women and equality of the sexes. In the final analysis, gender equality for rural women should include equal ownership rights to family land since security of tenure could be a catalyst for grassroots land management prioritizing land degradation neutrality. Ensuring equality is also about decreasing the burdens of rural women and enabling them to access vital services and goods.

Land degradation refers to natural and human-induced processes – including declining quality of soil, water, and/or vegetation – that negatively affect the capacity of the land to function effectively within an ecosystem. Land degradation and drought affect more than 169 countries today, with the severest impacts being felt in the poorest rural communities. Previous estimates projected that by 2025, approximately 1.8 billion people – more than half of them women and children – would be adversely affected by land degradation and desertification; these estimates have already been significantly surpassed, with 2.6 billion affected today.⁹ The focus and aim of land degradation neutrality (LDN) is “to maintain and improve the productivity of land resources by sustainably managing and restoring soil, water and biodiversity assets, while at the same time contributing to poverty reduction, food and water security, and climate change adaptation and mitigation.”¹⁰

The United Nations' Sustainable Development Goal (SDG) 15, Life on Land, is to “protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.”¹¹ The target for SDG 15.3 is to “combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world”¹² by 2030. The United Nations Convention to Combat Desertification (UNCCD) refers to “a land degradation-neutral world” simply as land degradation neutrality (LDN) and this latter expression is what will be used in this paper. While the causes and impacts of land degradation are many and varied, this paper discusses LDN primarily in the context of smallholder rural agricultural production. In this sector, gender issues are better defined in general, and similar across many cultures in both pastoral and farming communities. In some instances, the paper draws on the experiences of pastoral women to emphasize the prevalence of these challenges for women in different contexts.

Given the worldwide consensus on the hazard of accelerating climate change and the need to address it, adaptation and mitigation efforts may be expected to have considerable consequences for natural resource availability and use; this is especially the case for land, since many of the problems and solutions of natural resource degradation are found in agriculture.¹³ Agricultural activity feeds the planet and provides environmental services such as carbon sequestration. It occupies 40 per cent of the earth's land surface, consumes 70 per cent of global water resources and impacts biodiversity at the genetic, species, and ecosystem levels.¹⁴ Agricultural activity also contributes to soil erosion, agrochemical pollution and climate change, accounting for about one-third of greenhouse gas emissions.¹⁵

In turn, land and water degradation, shrinking biodiversity, and climate change all threaten the viability of farming in various settings.

Given gender-differentiated roles and responsibilities in natural resource management, interventions must address the specific needs and opportunities of rural women and men, particularly the poorest, to reduce inequalities, stimulate growth, and reverse environmental degradation.¹⁶ Achieving land degradation neutrality is ultimately an issue of the protection of the right to life. One out of every four people today lives in a rural area and – particularly in developing countries – their subsistence and livelihoods depend directly on the land. Environmental change, particularly in subsistence farming communities, has differentiated impacts stemming from differentiated gender roles in relation to the land. Consequently, land degradation neutrality programmes and policies should take these differentiated roles into account and not lose sight of the already heavy daily household workloads that rural women typically bear.

This paper will proceed as follows: Section I will present two theoretical frameworks that will underlie the discussion: ecofeminism and human vulnerability analysis. Systems theory will be a backdrop to the whole paper given the multiple levels of societal relations which, beginning in the family and extending beyond it to the economy and the environment, present a complex web of socioeconomic interactions within which land degradation is growing. Section II will present findings in the literature on gender and land degradation. Section III will address climate change, gender and land degradation. Section IV will discuss the conclusions, focusing on the importance of the role of the responsive state in the achievement of gender equality, which, it is argued, is a pre-requisite for sustainable land management and also for sustainable development more generally.

2. INEQUALITY AND VULNERABILITY

This paper's analytical framework draws from two approaches: ecological feminism (ecofeminism) and human vulnerability analysis (HVA). Ecofeminism covers a variety of "feminist perspectives on the nature of the connections between the domination of women (and other oppressed humans) and the domination of nature."¹⁷ The presented paradigm also recognizes diversity in women's experiences under the common umbrella of patriarchy and environmental degradation. Patriarchy defines and limits women's choices and agency – their ability to initiate action. For rural women, patriarchy impedes their ability to avoid environmental degradation and its consequences, thus further compounding their limitations. Ecofeminism examines the treatment of women and the treatment of nature with the goal of developing "theories and practices concerning humans and the natural environment that are not male-biased."¹⁸ Human vulnerability analysis, which has

developed from feminist critiques of society, focuses on the role of institutions in responding to the parties to a given issue – for example, men and women in the face of land degradation. It highlights the role that the state, through its laws and institutions, plays in conferring privilege and favor to one party (e.g., men) to the detriment of the other party (e.g., women) – and vice versa; it emphasizes the need for the state fulfill its role as the final arbiter and custodian of social justice. HVA also emphasizes the importance of taking a life-cycle approach when scrutinizing societal issues, with special attention being paid to the needs that arise from an individual's roles and responsibilities in society, as well as to their life-stage, whether that be adulthood, youth, infancy or old-age.¹⁹

Using an ecofeminist lens, this paper argues that land degradation and women's oppression are expressions of the same paradigm: a patriarchal approach to both nature and women. HVA complements this argument by underscoring the responsibility of the state to adopt policies and laws for achieving both gender equality and environmental resilience. Securing land ownership rights for women farmers, rewarding women's labor, and reducing over-work by providing the technologies, resources and services women need to meet household food security are important gender-responsive dimensions of achieving land degradation neutrality. Such an approach would build upon some of the earliest ecofeminist writings that emerged in the 1970s, which constructed powerful narratives surrounding women's deep connections to nature and the environment²⁰. They described how, over generations, women developed knowledge and practices that enabled them to produce food for their families, even while weather, climatic and other environmental patterns changed. Today, however, with the added and compounding factor of anthropogenic climate change, weather patterns, which were previously predictable, are now increasingly variable and volatile. Climate change is, thus, testing the limits of both traditional and scientific approaches to land productivity.

Human vulnerability analysis invokes a substantive vision of equality that goes beyond a discrimination-based model, which simply focuses on a limited dimension of the human experience, notably that of the male adult. HVA assesses equality across all stages of the life-cycle, from infancy and childhood, to adolescence, adulthood and old age. Given rural women's primacy in smallholder agriculture, promoting gender equality in the wake of climate change should begin with the experiences of rural women and girls, steering away from the historical equality approach that has tended to use male experiences and standards as the yardstick. This requires addressing the limited education that rural girls receive as compared with boys, which has long term implications for smallholder productivity and compensation in relation to the adoption of improved agricultural technologies.

HVA also calls for the recognition and accounting of the vital reproductive and care-taking roles women provide in the family, the value of which is “hidden” behind notions of family privacy and thus go unrecognized and unremunerated. This care-taking role extends to the land, and here too, women farmers’ subsistence production and contribution is not “valued” and is thus excluded from the Gross Domestic Product and unremunerated. HVA focuses on the structures society has to manage common human vulnerability as the pathway to attaining “a more substantive vision of equality.”²¹ In the agricultural setting, human vulnerability is linked to dependency on land and on environmental resources necessary for food production.

In the context of land degradation, the HVA approach is to examine how structural inequality between women and men places women farmers in a less resilient socio-economic position. This is salient when it comes to maintaining or increasing land productivity and when dealing with the impacts that climate change in rural agriculture. It is also worth examining how gender inequality may affect vulnerability for rural men, who may be less resilient than women in old age given their dependency on women for their daily food and care. These vulnerabilities could be mitigated through equality in land use practices that mitigate degradation. In this way, men also stand to gain in the long-run from gender equality, promoted throughout the life-cycle of all members of society.

The human subject of land degradation is a complex, vulnerable, multifaceted person whose needs and capacities change as the individual traverses the life-cycle from infancy and childhood, to adolescence, adulthood and old-age.²² One of the central elements to human vulnerability analysis is the role of the state and of its institutions in strengthening resilience and mitigating human vulnerability throughout the life-cycle.²³ A view of gender in which women are considered the primary victims, or in which changing gender roles and the human life-cycle are ignored, limits effective attention to land degradation and land restoration. Human vulnerability analysis, on the other hand, extricates gender analysis from such limitations by advocating responsiveness across the life-span.

From an ecofeminist perspective, many societies have historically approached physical vulnerability by placing unequal burdens on women and men, leading to the domination and privileging of men over both women and the environment (e.g., by traditionally granting men - and not women - ownership rights to land). One of the manifestations of this inequality today is the heavy daily workload that rural women and girls bear to keep their households running, as compared with men and boys. Rural female workloads are well-known and documented; they include fetching water - often by walking long distances, and sometimes at great personal risk -, collecting biomass

for use as fuel, tending to domestic animals, preparing and processing food, cleaning the home, and caring for children and the aged. Where clean water and sanitation are lacking, girls often face health threats that boys do not; where there is shortage of food, patriarchal norms have promoted feeding boys before girls. Ensuring gender equality means that once land is restored and productive, the benefits accruing must equitably meet the needs and interests of all: girls, boys, women and men.

The imbalance in rural gender roles, where men hold decision-making and ownership rights of the family’s primary asset (i.e., land), makes land tenure a key element in the struggle for rural gender equality, with ancillary implications for land restoration and sustainable development in general. Therefore, laws and policies aiming to achieve land degradation neutrality and land restoration should not only be gender-responsive but should also mandate the movement of rural societies away from male domination of land ownership rights towards equally balanced rights.

An immediate starting point for gender equality would be a more equitable sharing of the daily household workload between men and women, and girls and boys. This type of day-to-day action would aid in the revision of ingrained norms. Equality could also be fostered by providing women and girls with appropriate technology so as to reduce their labor burden. For instance, providing women with renewable energy and with running tap water for household use. Promotion of girls education is another key avenue for achieving gender equality in the long run.

While human vulnerability to land degradation and other environmental challenges - such as water pollution, climate change and biodiversity loss - are of concern to all societies, responses cannot take a “one-size-fits-all” approach. Context matters, and variations of all kinds need to be considered, be they of: physical location; culture; religion; gender relations; infrastructure; access to mitigating assets; strengths and opportunities available; and best approaches on offer to promote social and environmental resilience.²⁴ While human dependency on land resources - soils, water and biodiversity - is universal, and those resources “are the foundation upon which our societies and economies grow and prosper,”²⁵ environmental conditions shape the lives of women and men differently in different locations. Therefore, land degradation neutrality policies and laws, if they are to be effective, must take that differentiation into account.²⁶

3. GENDER AND LAND DEGRADATION

Drivers of land degradation can be divided into three groups: natural hazards, direct causes, and underlying causes.²⁷ Natural hazards are the conditions of the physical environment that lead to the existence of a high degradation risk, for instance, steep slopes as a hazard for water erosion.²⁸ Direct causes of land degradation can be either natural or human-induced. This said, although natural climatic variations are a driver of land degradation, anthropogenic climate change is pushing such variations into uncharted territory, with extreme weather events such as droughts, floods, typhoons, heat waves and others becoming increasingly frequent and unpredictable. Direct human causes of land degradation, meanwhile, include unsuitable land use and inappropriate land management practices, such as, for instance, the cultivation of steep slopes without measures for soil conservation.²⁹ Underlying causes relate to the reason behind such inappropriate land use and management practices. For example, steep slopes may be cultivated because the landless poor need food, while conservation measures may not be adopted because farmers lack security of tenure.³⁰ Today, land degradation affects 33% of the earth's land surface, with negative consequences for more than 2.6 billion people in more than 100 countries,³¹ a disproportionate number of whom are women and children.

There is no consensus in the literature regarding the degree to which land degradation can be attributed to natural or anthropogenic causes. However, "the context-specific nature of the interactions between various drivers of land degradation, where socio-economic, institutional and technological particularities of the location shape the nature of the interactions between the drivers"³² is important, and gender relations are an integral component of this complex whole.

In rural communities, maintenance and improvement of smallholder land productivity is closely tied to women's traditional knowledge and skills in farming, as well as to their access to soil enriching inputs and scientific developments, normally provided by means of agricultural extension services. Yet studies show that extension services primarily target men and, in some societies, cultural norms present additional barriers for male extension service providers to work with women farmers. The latter are thus put at a disadvantage when it comes to accessing the knowledge and resources that can improve their land management practices and soil productivity.³³

Patriarchy has negative ramifications for improving women's knowledge and practices, with implications for land degradation, land restoration and rehabilitation. The gender gap in rural agricultural services imposes costs not only on women and their households, but also on the broader economy and society.³⁴ Closing that gap could increase yields for women farmers by 20 to 30%, and raise

total agricultural output in developing countries by 2.5 to 4%.³⁵ Providing women with labor-saving and productivity enhancing technologies and infrastructure would also allow them to make their time available for other productive activities.³⁶

One of the requirements for reaching and maintaining land degradation neutrality (LDN) and advancing land restoration and rehabilitation (LRR) is the achievement of "a more equitable balance in workloads and in the sharing of economic and social benefits"³⁷ between rural women and men. Women's domestic daily chores restrict their time and mobility and signify an important constraint on their farming activities, on which their families rely for food, and through which household agricultural productivity can be increased.³⁸ This inequality in workloads also comes with health costs for women. In Kenya, for example, "women can burn up to 85% of their daily calorie intake just fetching water."³⁹ A reduction in women farmers' daily workload is thus an important factor for mitigating land degradation and achieving LDN as this would free up their time and energy towards increasing sustainable land management.

Land degradation is increasing in the poorest communities, notably because they lack assets to mitigate their vulnerability to it; the state, therefore, must proactively respond to these communities' lack of resilience. Rural land degradation neutrality initiatives could simultaneously tackle poverty and gender equality by remunerating women farmers' unpaid subsistence farming work, which would also improve their marginalized social positioning. As feminist researchers have highlighted, poverty is a gendered phenomenon, with many of the world's poorest people being rural women.⁴⁰ State-sponsored programmes also need to find ways to increase women's decision-making in the household since equality on that level has been found to translate into "better prospects and greater well-being of children, (thereby also) reducing poverty of future generations."⁴¹

3.1 Land Rights

A study of Ethiopia's recent land certification programme confirmed past findings that ownership increases investments in, and outputs from, the land.⁴² Structural constraints are the dominant contextual barriers that prevent women farmers from engaging in sustainable land management. These include insecurity of land tenure, lack of value recognition for subsistence labor and farming, and lack of access to credit and technology. There is also a dearth of opportunities for women to obtain and share technical knowledge because extension workers usually target those with the means and resources needed for production, and such farmers are primarily men.⁴³

Rural women's insecurity of land tenure is underpinned by cultural norms,⁴⁴ which determine that women's access to land be mediated by their relationship to men. While such arrangements may have been acceptable in past societies, in the 21st century women must not be left behind in acquiring property rights to land and to its produce. These are things which today are protected by law; moreover, the possession of such rights positively correlates with higher agricultural output, sounder land management practices and greater influence in community decision-making.⁴⁵ Patriarchy persists in all regions, but it is particularly impactful in developing countries where access to land generates the primary source of income. A study of 173 countries, undertaken in 2015, found that in 153 of the countries analyzed, there was always at least one law impeding women's economic opportunities.⁴⁶

In situations where women farmers already have secure informal (i.e., customary) land rights, acquiring a formal title would preempt tenure challenges from outside parties. A formal title can, in such cases, be acquired by converting a customary title into a freehold title and registered with the state. Equally, this can be done via the statutory recognition and codification of a customary title in the government registry.⁴⁷ Where strength of customary tenure exists, it should be bolstered by legal registration in order to protect women in cases where traditional practices and laws may be subsequently invoked to disenfranchise them from customarily acquired tenure.

For women that are heads of households, their susceptibility to losing land rises if their access to it passed through a male counterpart, be it a husband, brother or father. Women can lose their property rights following marriage, widowhood, divorce or desertion.⁴⁸ Sustainable land management, as well as women's influence in the household and community, can be negatively impacted under such tenuous circumstances. "In Mexico's ejidos, for example, only persons who have ejido ownership rights to land are considered ejido members with the right to vote on community issues. The denial of property rights is often used as an exclusionary mechanism for ethnic or racial minority groups. When women are denied equal property rights, they also experience reduced social, economic and - often - political status."⁴⁹ The achievement of land degradation neutrality can thus be linked to the achievement of gender equality in the arenas of land ownership (which correlates with increased wealth) as well as household and community influence.

The correlation between secure land rights and farm productivity appears to be especially accurate in wealthier developing regions - Latin America and Asia. In Africa, however, although there are relatively high levels of customary tenure security in rural areas, there is also higher poverty.⁵⁰ Customary tenure can lack the enforceability found in state-backed rights, underscoring

the need for additional formal rights under gender equality norms that a responsive state can enforce and thereby strengthen legal foundations for increased farm productivity. For developing countries, securing property rights is a pre-condition for at least three actions. First, attracting farm investments that foster productivity and increase farm incomes. Second, growing investor interest in farmland. Third, driving contextual changes, in sectors such as population growth, settlement patterns, political conflict, environmental degradation and climate change.⁵¹

3.2 Unequal Labor Burdens

Men can also be encouraged to take up some of the daily chores traditionally undertaken by women, such as providing household energy and water. This will free up women's time and energy to take care of the food and other family needs. Early training of boys in this area will ensure that new generations of men are socialized in such a way as to bear their fair share of household work. Increasing girls' education early, meanwhile, can increase women's productive capacities and abilities to mitigate land degradation on their lands later in life.

When rural family land is degraded, the burden on women is increased, for - in addition to their reproductive and care-taking roles - they then also need to find further ways to supplement their declining food production. Such women are typically compelled to sell their labor - which is their primary asset - to wealthier farmers, or to engage in petty trading to buy additional food for their own families.⁵²

A study of women in Vihiga County in Kenya found that when women find themselves pressured to engage in income-generating activities in order to meet the increased cash needs of the family, they prioritize earning cash along with carefully managing the primary farmland near the homestead in which they cultivate food for their immediate needs. The other family responsibilities and farmlands tend to be abandoned due to the overwhelming demands on women's time and energy. Unlike the land that is needed for immediate family food production, which is sustainably managed, the remaining lands are more vulnerable to degradation.⁵³ This shows that women have agency for sustainable land management but their heavy workloads also compel them to make choices that can lead to land degradation. This suggests that achievement of land degradation neutrality may, in such cases, be tied to a rebalancing of workloads between rural women and men - or by finding the means to reduce their workload. Men may need to take up some of the daily or seasonal responsibilities of women, which may result in greater attention paid to family land. Reducing women's workloads would free up their time and energy, meaning they could give greater priority to land management practices which increase food production and conserve ecosystems that may be vulnerable to desertification, land degradation and drought.⁵⁴

Freed up time would also make women available to participate in training programs on sustainable land management that are tailored to their local conditions. By directly addressing the nexus between gender equality and land degradation, more effective and sustainable strategies for achieving land degradation neutrality are likely to emerge.⁵⁵

The gender division of labor in rural areas where women are the primary cultivators of land and men are predominantly cash earners – a pattern that is found in many parts of Africa, for example – can be both an underlying and direct aspect of land degradation.⁵⁶ The unequal power relations between women and men in rural households, underpinned by male ownership of land, is a classic example of men's dual domination of women and the environment, which ecofeminists have long critiqued. This inequality translates into poor land management since the final decision-making regarding land use and management usually rests with a male owner who lacks the intimate knowledge of the land that the woman has acquired by working on it.

3.3 Poverty

Worldwide, all continents are experiencing land degradation, with high incidence being found along the west coast of the Americas, across the Mediterranean region of Southern Europe and North Africa, in the Sahel and the Horn of Africa, and throughout Asia.⁵⁷ Globally, 78% of total degraded land is located in terrestrial ecosystems other than drylands.⁵⁸ Global assessments in 2008 indicated that the percentage of total land area that is already degraded, or being degraded, rose from 15%, in 1991 to 24%, in 2008, with more than 20% of all cultivated areas, 30% of natural forests, and 25% of grasslands undergoing some degree of degradation.⁵⁹

Drylands, or arid, semi-arid, and dry sub-humid areas, are home to 2.3 billion people⁶⁰. Many drylands communities face increasingly destabilizing challenges, including recurrent drought, limited economic infrastructure, and insufficient programmes to mitigate environmental vulnerability. Drylands herald the beginning of desertification – and desertification and poverty are understood to be closely and directly linked to each other.⁶¹ Desertification can lead to famine, malnutrition, under-nourishment, epidemics, economic and social instability and migrations, which, in turn, can also cause or increase desertification.⁶²

Although land degradation is considered to be a generalized risk arising from human activity, about 40% of the world's degraded lands are found in areas with the highest incidence of poverty, which are still overwhelmingly rural.⁶³ Poverty contributes to dryland degradation by inducing poor women and men to exploit the natural resource base in an unsustainable manner.⁶⁴ Degradation leads to lower productivity and incomes, thereby increasing poverty and

further exacerbating pressure on the natural resource base.⁶⁵ Examples of this cycle are found in China; in India, both in–Telengana and Andhra Pradesh; in Mauritania; and in Niger and South Africa.⁶⁶ Rural communities – whose dependency on the land for daily subsistence is the most immediate and direct, a situation compounded by cash poverty in a globally monetized economy – are among the least resilient to land degradation. State resources and programmes for mitigating this vulnerability are, thus, needed. The difficulty, however, is that such communities are mostly found in developing countries which are, themselves, on a similarly unequal footing with regard to the global economy; this often leaves states handicapped in their efforts to mobilize sufficient resources to allocate towards programmes for the rural poor.

Women are not only on the front line of drylands development, managing land and water resources, they are also the key determinants of the livelihood options for families.⁶⁷ Deeply entrenched discrimination, inequality and stereotypical gender roles, however, limit their economic potential and decision-making opportunities, with negative implications for their resilience to climate change and climatic variations.⁶⁸ Properly equipped and empowered, women can be active agents of change in driving resilient development in the drylands. They have a strategic role to play in building resilient livelihoods and ecosystems in the drylands especially within the wider context of climate change.⁶⁹ In view of these considerations, local, national and international institutions must address both the constraints and opportunities in drylands communities via strategic actions to enhance the role of dryland women farmers so as to achieve resilient, inclusive development.⁷⁰

Despite their multiple roles in dryland management – in a situation akin to their counterparts in agricultural lands – dryland women's access to, and control over, land and other natural resources is limited; their access to support services, such as credit and extension services, is equally often restricted.⁷¹ This limited access traces to a series of interrelated social, economic and cultural factors that force rural women into a subordinate role that hampers their productivity and limits their participation in decision-making processes and development initiatives.⁷² In some cases, customary practices and laws that limit women's rights to land prevail even over legislation that guarantees those rights.

Particularly pressing to the issue of dryland management is the fact that insecure land tenure reduces both women's and men's incentives to maintain soil quality, since they retain no permanent rights to the land.⁷³ This is similar to the situation of women in agricultural lands who are the primary producers on smallholder farms but don't have ownership rights.

Male owners of agricultural lands, on the other hand, can benefit from extension services where these exist, which, combined with security of tenure, can make them more committed to maintaining soil quality. Without secure land rights, farmers have little or no access to credit, to rural development organizations and to other agricultural inputs and services. These challenges are evident from analyses of Burkina Faso, Niger, and Senegal in Africa, as well as Telengana and Andhra Pradesh in India.⁷⁴ In addition to this, the infrastructure of most developing country rural areas is poorly developed; this inadequacy is even more pronounced with respect to the services women require to improve their productivity, such as organized market facilities or food storage and processing facilities.

3.4 Demography and Other Factors

Rural land degradation has a number of primary causes. Besides gender inequality at the household level, other factors include: population growth which leads to agricultural expansion; unsustainable cultivation methods; overgrazing; and deforestation.⁷⁵ Deforestation leads to the loss of genetic and species diversity, including plants and animals which can often be important sources of medicinal, commercial, and industrial products.⁷⁶ Land degradation also occurs in urban areas, due to rising populations and the spread of informal settlements. In South Africa, for example, “soil erosion makes rivers muddy and causes dams to fill up with silt, adding to the costs of water purification and storage.”⁷⁷ Population growth is, therefore, a common factor in both rural and urban land degradation in the global South.

“Low gains to investment and productivity in Africa following tenure formalization may also be explained by the low levels of wealth and income of African farming families in comparison to those studied in Latin America or Asia.”⁷⁸ Existing qualitative studies and literature on African agriculture “suggests levels of rural agricultural productivity in Africa may remain weak due to factors other than tenure insecurity.”⁷⁹ These other factors “may include small farm size, the importance of off-farm income to rural households, the high opportunity costs of agricultural labor, and the associated deployment of working-age family members to urban centers for work, among others.”⁸⁰ In Latin America, for example, of the estimated 58 million women that live in rural areas, only between 8 and 30% own land.⁸¹ Women in this region (akin to those in Africa) tend to have smaller farms with lower quality soil, and also to have less access to credit, technical assistance and training.⁸² Due to the patriarchal nature of Latin American society, a high percentage of people working in technical assistance do not visit women farmers.⁸³ Women, therefore, tend to cultivate and own farms that have lower quality soil, in addition to having less access to credit, technical assistance and training.⁸⁴ Workloads between men and women in rural Latin America, just as in Africa and Asia, are also not balanced. In Mexico, for example, women

work 89 hours a week on average, while men work only 58 hours.⁸⁵ Despite this big differential, nearly 40% of rural women have no incomes of their own, while only 14% of men are in that situation.⁸⁶

3.5 Women’s Agency

Cultural barriers to achieving land degradation neutrality are found in patriarchal norms and values that expect women to shoulder unremunerated reproductive and productive roles in the home. One way in which women are managing their multiple roles is through the formation of women’s groups to assist each other with both production duties (tilling, sowing, harvesting) and childcare. In the Mboula region of Senegal, for instance, the regional government allocated women’s groups multipurpose gardens for household food production. The women have organized themselves into work groups that take turns to tend to the garden. Each group works one day a week. This has reduced women’s farm labor and strengthened their household food security.⁸⁷ Some of the groups are now exploring how to commercially process oil from a local tree to enhance their incomes.⁸⁸ By integrating their new idea into the multipurpose gardens, the women would also improve their gardens through agroforestry and strengthen the resilience of their farm to climate change.

Such groups – which can be the expressions of an incipient civil society in rural communities – fill a social service gap that a responsive state should provide. Rural women farmers thereby find ways of mitigating vulnerabilities attendant to their roles as unpaid producers and reproducers in society; they turn to each other for social support, and create revolving credit groups for economic support. Examples of such groups are found in many countries in Africa including Kenya, Burkina Faso, Ethiopia, Malawi, Tanzania, Niger and Uganda.⁸⁹

In Asia, women’s farmer groups are gateways through which individual farmers can access credit or support from the state (Bangladesh, Nepal, Myanmar).⁹⁰ Women farmers’ position is often one of vulnerability: in relation to the state, they appear secondary to male farmers, whom state services target; while cultural expectations expect them to provide productive, reproductive and family care-taking services free of charge. This has seen them mobilize via the formation of grassroots groups to mitigate their vulnerability to low food production in the wake of degrading land. By extension, they mitigate the vulnerability of those dependent on them.

Women’s groups are largely used by women to overcome challenges such as financial and labor shortages; they should be used as assets to further empower women. Their high rates in loan repayments should be capitalized upon to enable women to access finances.

Their organizational potential can be built upon and developed to make the groups more entrepreneurial so that they might eventually become viable business entities. By carefully organizing their work cycles, women's groups can minimize the amount of time women spend on farm labor.⁹¹

In Latin America, women farmers are unremunerated reproducers and producers of family food in addition to engaging in income-generating activities (Ecuador, Colombia, Peru, and Venezuela).⁹² For instance, in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Brazil, Paraguay and Uruguay income generating can take up as much as 54% of women farmers' time, especially in female-headed households.⁹³ In sum, rural smallholder women farmers are affected by gender power relations, a paucity of land rights, heavy workloads, and rural poverty; these factors all have implications for land degradation and for these women's ability to prioritize land restoration and rehabilitation. Struggles for land and for gender equity are related to power and to processes of empowerment.⁹⁴ Whether land represents an important cultural resource or a productive factor and capital asset, those who control land rights have a certain amount of power over those who do not, especially in rural areas.⁹⁵ The rights, statuses and opportunities that men in many cultures hold by virtue of their sex translates into a certain amount of control over⁹⁶, and discrimination against, women - hence the call for equal rights and opportunities for women farmers.

The Green Belt Movement (GBM) of Kenya showcases women's successful efforts to build resilience in the face of environmental degradation. The Movement was founded in 1977, by Professor Wangari Muta Maathai, under the auspices of the National Council of the Women of Kenya (NCWK), in response "to the needs of rural Kenyan women who reported that their streams were drying up, their food supply was less secure, and they had to walk further and further to get firewood for fuel and fencing."⁹⁷ The Movement encouraged and assisted women to come together "to grow seedlings and plant trees to bind the soil, store rainwater, provide food and firewood, and receive a small monetary token for their work."⁹⁸

The establishment of the GBM is evidence that land degradation was already a problem for rural women farmers almost half a century ago. In addition to the hardships of environmental degradation and food insecurity, it was also apparent that women farmers in Kenya lacked the necessary agency to protect their environment, and were further disenfranchised by the progressive loss of traditional values that had historically enabled rural communities to conserve the environment and work together, honestly and selflessly, for mutual benefit.⁹⁹ Traditional values in environmental management was historically conservation based, with each generation managing the land for their own benefit and for the benefit

of future generations to whom they would bequeath the land. Despite the patriarchal foundations on many rural communities, conserving the land for future generations did not hinge on rejection of patriarchy. However, as rural societies become increasingly cash-based and modern, and land becomes more commoditized, patriarchal norms that have resulted in increased rural women's workloads in modern times, together with increasing population that puts pressure on land and changing outlooks as rural and modern societies interface, mean that traditional values that ensured land management and environmental protection for future rural generations are becoming progressively eroded. Clearly, not all traditional values were detrimental just as not all modern values are harmful. Traditional and modern values both have positive and negative aspects.

The Movement trained women to take charge of protecting their local environments without waiting for action from a political leadership that was irresponsible to their needs. The small cash payments women farmers received for their tree planting and conservation work sent a revolutionary message: that their time, energy, knowledge and efforts - for the family and the community - deserved financial compensation. This message reverberated even though GBM, as a non-profit organization, was only able to make token payments rather than remunerate them for the full value of their labor. Nonetheless, the tide turned. Rural women started taking charge of conserving their lands, soils and water, and to demand the state's attention to their problems.

The Movement has steadily gained momentum and worldwide recognition. However, increasing land degradation, both in Africa and other parts of the world, indicates that the struggle for land degradation neutrality and rural flourishing is far from over. Mobilization at the grassroots level is already taking place. States now have to take the baton by supporting rural smallholders with extension services, farm inputs and meaningful remuneration of their labor, as incentives for achieving land degradation neutrality at the household and local levels. The UNCCD's focus on land degradation neutrality, therefore, is a crucial segue for parties to the Convention to channel resources and technical assistance to those that need them most. Beneficiaries may be States and/or communities, with respective levels of vulnerability, as well as their individual position within the global, national or local political economy, being used as indicators of the amount of resources each should receive.

4. CLIMATE CHANGE AND LAND DEGRADATION

Land degradation will remain an important global issue for women in the 21st century given its adverse impact on agronomic productivity, the environment, food security and quality of life.¹⁰⁰ Climate change, is and will remain, a compounding factor. This is particularly true for communities that rely on rain-fed agriculture. Unpredictable and changing rainfall patterns impact crop production negatively, and also reduce the efficient conversion and storage of carbon dioxide from the atmosphere into biomass, a leading source of fuel for rural societies.¹⁰¹ For farmers living in the drylands - arid, semi-arid and dry sub-humid areas - where productivity is already constrained by low water availability, land degradation is a harbinger of desertification.¹⁰² Farmers that rely on rainfall for food production or for livestock watering may find their resilience compromised by changing weather patterns.

Climate change also brings challenges when it comes to the goal of land degradation neutrality; the obstacles are exponential, since human activity drives both climate change and land degradation. In the last two centuries, for agricultural purposes, human beings have cleared or converted 70% of grasslands, 50% of the savannah, 45% of temperate deciduous forests, and 27% of tropical forest biomes.¹⁰³ Between 1985 and 2005, the world's croplands and pastures expanded by more than 154 million hectares.¹⁰⁴ Commercial agriculture is considered to be the proximate driver for around 80% of deforestation worldwide.¹⁰⁵ These changes in land use are negative indicators for achieving land degradation neutrality. While climate change was not yet an issue of concern in the developing regions in the 1970s, drying streams, declining food production and deforestation - which are all linked to climate change - spurred the founding of grassroots movements like GBM and the Chipko Movement in India (discussed below) to assist grassroots farmers to build resilience to their degrading environment.

Productive land is becoming scarce due to the convergence of land degradation, population growth, climate change, unsustainable land use and urbanization. Analysis of field experiences shows a link between population growth and land degradation in dryland areas. States ought, thus, to perhaps explore ways in which they can support pastoralism rather than the often suggested alternative of settling pastoral nomads into a farming or urban lifestyle. With regard to population growth, the educational advancement of women can reduce fertility rates: there is a correlation between increased education for women and fewer children being born. In this way, women's educational advancement has an indirect effect on the sustainable development of drylands, as is evident in some parts of China and the Sudan.¹⁰⁶

Competition for productive land is increasing due to growing demand for food, fodder and agricultural raw materials for industrial and energy use.¹⁰⁷ The interactions between climate change and land degradation are highly complex and difficult to predict, however it is fairly clear that they may affect a range of different ecosystem functions and the services they deliver, with consequent impacts on food production, livelihoods and human well-being.¹⁰⁸ As key actors in the rural food production chain, women farmers and their households would necessarily be impacted by these interactions.

Extreme weather events from global warming could significantly reduce human resilience to drought and cause food systems disruptions on a global scale.¹⁰⁹ Rural women farmers' productive, reproductive and care-taking duties would be severely tested in such a scenario, with adaptation and mitigation becoming viable only if the state were to make appropriate and timely interventions so as to provide effective, gender-sensitive programmes that promote sustainable land management, thereby ensuring smallholder resilience. Such an approach would align with the policy reform scenario described in the UNCCD document on the Value of Land.¹¹⁰

Climate change and its impacts, which include "biodiversity loss and constraints on access to productive and natural resources, amplify existing gender inequalities and jeopardize the well-being of all."¹¹¹ Climate change adds pressure on "already fragile, undervalued and precarious gender roles at the community level, which shape the nature and extent of exposure, sensitivity and impacts."¹¹² For women farmers that rely on agriculture and natural resources for their livelihoods, the gender-differentiated impacts of climate change can intensify the disadvantages they already have.¹¹³ These include additional work burdens, climate and disaster-related health risks, and water and fuel scarcity, all of which add to the onus of women's unpaid work.¹¹⁴

Ultimately, human behavior and attitudes regarding the use of land and other natural resources, which industrialization has taken to be "limitless", will need to be readjusted. The domination of land and the environment for economic gain, is connected to the domination and economic exploitation of women. They are paid lower wages and their reproductive and care-taking contribution to society are "privatized" (i.e., not paid), whereas men, typically, carry out economically productive roles. Undervaluing rural women's contributions in land management puts them at risk of being a low-priority constituency for state programmes that address climate change adaptation and mitigation because these programmes will likely be more responsive to activities that are captured in the GDP.

Addressing patriarchal attitudes towards women and the environment through policy is a key component of achieving gender equality, land degradation neutrality, and mitigating climate change.

Women's differentiated vulnerabilities to climate change are found in gendered labor and care-taking roles, as well as in social status.¹¹⁵ Intersecting power relations and shifting gender roles may open new avenues for grassroots projects aimed at coping with the impacts of climate change within a context that promotes gender equality.¹¹⁶ Where such shifts and intersections result in greater empowerment of women, the fight against climate change could become a contributor towards the advancement of gender equality, while simultaneously advancing land degradation neutrality. The current picture, however, is one where land degradation and climate change will have increasingly negative impacts on families at the community level especially where state services are unavailable, and where private ones, if available, are unaffordable.¹¹⁷

The central role women play as producers of goods and services from the land makes them a vital strategic partner in the realization of the SDGs and the climate change agenda.¹¹⁸ Over the past fifty years, ecosystems have changed more rapidly, spurred by the need to meet rapidly growing demands for food, water, timber, fiber, and fuel.¹¹⁹ Changes which have led to mono-cropping also contribute to the degradation of natural resources, and can exacerbate poverty for some groups of people, especially those living in marginal environments.¹²⁰

In looking to promote gender equality and land degradation neutrality in the wake of climate change, some key areas that need to be addressed include: i) Understanding the differing roles, responsibilities and knowledge in managing natural resources that exist between men and women; ii) Addressing gender differences in rights and access to land and other natural resources; iii) Addressing gendered access to, and interventions regarding, new technology, information and training related to natural resource management; iv) Uncovering new forms of cooperation, conflict or controversy between men and women or different ethnic groups arising from land degradation; v) Correcting the absence of women from natural resource-related decision-making processes at all levels;¹²¹ and vi) strengthening women's access to goods and services for market access and food production and storage.

Regarding the differing roles, responsibilities and knowledge in land management between men and women, the out-migration of men from rural areas in search of jobs is a significant factor. It not only increases women farmers' workloads, but also triggers a change of role for women. For example, out-migration of men compels women to take on some of the work previously done by the men, such as tending to large farm animals.

Moreover, as climatic conditions change, women find that their new responsibilities require additional or new knowledge, technology, resources and time, which they lack and are thus unable to carry out these additional tasks successfully.¹²² Male out-migration also compels women to engage in income-generating activities in addition to their farm production activities, thus forcing them to juggle multiple roles and responsibilities, with negative implications for the amount of time and energy they can put towards sustainable land management.

Meanwhile, the young men that choose to remain in rural areas are sometimes compelled towards environmentally unsound decisions. This is due to declining rainfall, reduced land holdings as a result of fragmentation after inheritance, and minimal job opportunities. This combination of factors may lead them to cut down trees to make charcoal, or harvest sand from dry river beds to earn cash. Felling trees and burning them as charcoal fuels climate change by emitting greenhouse gases into the atmosphere. Sand harvesting exacerbates water scarcity.¹²³ These kinds of land degrading responses to socio-economic pressures further reduce local communities' resilience to negative climatic impacts.

The Chipko Movement in India is a striking case-study in community resistance to environmental degradation; the case concerns deforestation, being thus an issue directly related to anthropogenic climate change.¹²⁴ The Movement began in 1973 when male workers organized in protest against state forest policies that hampered local enterprises. These small businesses, accounting for a number of manufacturing jobs, depended on collecting forest herbs, roots and pine, from which to produce turpentine and resin for sale. State policies curbed access to pine trees despite the villagers offering to pay higher prices for the trees than those paid by a partly state-owned producer. The villagers were furthermore prohibited to purchase ash trees, which were sold to a sporting goods company instead. When the company arrived to cut down the trees, villagers beating drums and singing traditional songs marched to the forest and prevented the felling of the trees. When the state allocated trees in a different forest to the company, the villagers staged organized protests and kept vigil on the new site.

The Chipko Movement was initially a protest driven by male villagers' determination to mitigate local unemployment problems and monsoon erosion of the forest that precipitated flooding and landslides that swept away hundreds of homes. But it brought home the realization that clear-cutting of forests and livestock grazing had to be pursued in a sustainable fashion, otherwise a classic tragedy of the commons would result,¹²⁵ with the community as the ultimate loser.

When, in subsequent years, the government announced it would auction trees in Reni forest where flooding had previously occurred, Bhatt, a Chipko organizer, appealed to the villagers to hug the trees to prevent their felling. The response came through a woman, Gaura Devi, who mobilized other women in Lata village, who stepped forward and saved Reni forest. It is notable that it is the women who put their own lives on the line to save the trees. The Chipko Movement also became a vehicle through which women voiced their need to be included in community decision-making. It occasioned a backlash from some male quarters, but opened a new chapter in gender equality and ecological conservation in rural India. Chipko was also a first-hand opportunity for local communities to understand the link between human activity and changes in micro-climates which can lead to environmental disasters. An important lesson from the Movement is the imperative for balancing human needs with environmental conservation and how, in the context of climate change, local actions ultimately have diffuse, global impacts.

The Chipko example also demonstrates how the state, too, can be an agent in environmental degradation. At the social level, gender differences in rights of access to land and other natural resources can be a limiting factor for sustainable land management, notably in the case of women that only have usufruct rights to land. In the climate context, women's agency in managing risks and containing threats to their livelihoods can be constrained by their lack of land ownership rights, which is widespread in Africa and Asia, especially where a male owner makes decisions for the land, preempting women's adaptation and mitigation responses.¹²⁶

5. CONCLUSION: THE ROLE OF THE RESPONSIVE STATE

There are at least five policy areas that need to be addressed in supporting women as agents for achieving land degradation neutrality. These are: balancing of workloads between men and women; land tenure security; inclusion in decision-making; access to sustainable land management techniques and knowledge; and improving subsistence farming resilience.¹²⁷ It will also require changes to current mechanisms and structures so as to enable women to realize their full potential, using and managing their lands sustainably - and being rewarded for it. The objective would be to boost women's empowerment so they can play more effective roles in food production whilst sustainably managing their land, minimizing the negative effects of climate change and biodiversity loss, and harnessing knowledge and technology. These actions would eventually lead to the achievement of the gender equality and land degradation neutrality targets of the Sustainable Development Goals.

The specific aims include: i) ensuring that all initiatives undertaken to rehabilitate and restore degraded land, in the context of the SDGs, are gender sensitive and responsive to the heavy daily workload of rural women; ii) sharing and disseminating best practices that can enable women to overcome the obstacles they face in obtaining land rights; iii) identifying policy incentives needed to strengthen women's resilience to climate change; and iv) strengthening the voices of women land-users at all levels in policy processes.¹²⁸

The state is the final arbiter of rights and duties, as well as the coercive power in society; it should, thus, promote policies, laws and institutions that are responsive to women farmers' vulnerability. While women should not shy away from using the law to claim rights to land, equal remuneration, fair working conditions and a voice in the policy arena, the fight for equality - especially in entrenched patriarchal societies - will be long, and likely to suffer many reverses. A responsive state can, through its policies and programmes, preempt or shorten women's struggle by mandating that women's voices be heard and their vulnerability mitigated, providing them with resources that promote resilience.

When women farmers' are given security of tenure this has been shown to correlate with increased sustainable land management. In the Rift Valley area of Kenya, for instance, even during extreme weather events like drought, women sustainably manage the "kitchen gardens" adjacent to their homes, which they develop on land that is theirs for life, as per cultural norms. This indicates that where women have confidence that the land they till 'belongs' to them, they will invest the time, energy and knowledge needed to keep that land sustainably productive throughout their lifetimes. Gender-equitable governance of land and other natural resources are essential for a sustainable future all over the globe. Security of land tenure and its responsible governance also ensures that the needed investments for healthy soils are realized, which improves resilience to floods and drought, as well as adaptation to new climatic conditions.¹²⁹

But limiting gender action to security of tenure alone is not enough for various reasons. First and foremost, the resilience of the patriarchy cannot be over emphasized. In Western Europe, women farmers are still limited by the dominance of patriarchal decision-makers¹³⁰, in spite of the progress in gender equality in some areas. The prevailing view on agriculture and food in Europe and in European institutions is limited to economics and trade where "(old) men in suits discuss amongst themselves and take decisions."¹³¹ European women work in urban gardens, sell at farmers' markets, do catering and process food.¹³²

According to the farmer activist group La Via Campesina, “European agricultural policies are now designed for big industrial farms. Women hardly benefit from this because they often have smaller and multifunctional farms. Policies should not be about the production of single crops per hectare. Current European hygiene rules make it extremely difficult for small producers, most of whom are women, to sell processed foods, because regulation in this area is designed for big industrial food processing and catering. Yet, European smallholders have developed and used production and processing techniques and have been doing their own plant breeding for generations.

In Eastern European countries like Albania, for instance, more than 57% of women are employed in the agricultural sector and, similar to their counterparts in Africa, Asia and Latin America, land tenure is an issue for them. Albanian women farmers are less likely to inherit land as they normally relinquish their property rights to their brothers upon marriage.¹³³

Secondly, the emergence of innovative arrangements which empower women to acquire the means to purchase their own land, suggests that there are many paths to the same goal, known as equifinality in open-systems theory. Innovative tenure regimes, for instance - that grant local authorities the power to allocate land to women -, may be more viable than demanding change at the national level. Furthermore, locally negotiated land rights, in harmony with local cultures, are more likely to succeed in granting women and women’s groups security of tenure. For instance, following consultations with local leadership, the Mayor of the town of Dori in Burkina Faso assigned land to women that work in groups. This amounts to about 1.5 acres of land per group-member, with a view to planting baobab trees for household food production. The land is located near a local forest. The decision was based on the need to provide land close to a perennial source of water in order to minimize women’s labor but also because the plants will increase the forest area.¹³⁴

Policies and research should support further development and use of women’s knowledge, build women’s groups organizational capacities, find innovative ways to provide women with financial resources, and include female food producers in policy making. Public institutions such as schools, hospitals and municipality offices could procure products locally from women, and especially from women’s groups. This would give local women involved in food production a major boost.¹³⁵ In Senegal and Uganda, for instance, providing support to women’s groups has not elicited competition from men. Rather, the men interested in receiving similar benefits join women’s groups, without any stigma.

A responsive state cannot be one that waits for women farmers to take state institutions, or male family members, to court. Rather, it must be one that prioritizes the human needs of all its citizens given their roles and positioning in relation to national and local legal and institutional frameworks, as well as customary law and practice, where applicable. Technical training, access to credit and to markets, and the provision of market infrastructure that specifically targets women’s sustainably managed lands are all areas where the state can be the first responder, in an equitable manner. In the case of states which have ratified one or more global agreements, aligning national law and policy with international standards can make it a more attractive partner for economic and technical transfer from international partners.

Ethiopia, Namibia and Cambodia are examples of responsive states that have used different approaches to promote gender equality in land rights. In Cambodia, the government uses a systematic land registration process that has ensured that more than 60% of land titles issued have been done so jointly, to both husband and wife; 19% have been issued exclusively to women, 8%, exclusively to men, and the remaining 10% is owned by companies, associations and the public.¹³⁶ Namibia’s Communal Land Reform Act provides for communal land boards: these must include two women engaged in farming operations within the board’s catchment area, as well as two women who are experts in the board’s functions.¹³⁷ The purpose of the women experts is to proactively assist women farmer’s to successfully apply for, and receive, titles to traditionally governed land. In 2005, Ethiopia systematically mapped out its lands and initiated a certification programme in order to grant joint land ownership rights to women and men, as well as individual ownership rights to divorced or widowed women. This programme has improved women’s participation¹³⁸ and decision-making¹³⁹ on land related issues both within and outside the household.

Gender roles, household workloads and access to the goods and services smallholder farming communities require to produce food are key issues that must be addressed in strategies to achieve land degradation neutrality. The compounding effects of climate change on these issues require the operationalization of intersectional approaches. Such strategies should be geared towards ensuring gender equality, which can mitigate the unjust effects of patriarchal norms – such as skewed land tenure rights that privilege men - which prevail in many rural communities. Formal land ownership by women farmers has been correlated with increased farm productivity in Latin America and Asia. In Africa, where women farmers have access to land based on customary laws, formal ownership would protect them from losing their farms, especially when they become heads of households, as can happen through widowhood.

Formal land ownership in rural areas would give women farmers powerful tools that rural male land owners already enjoy; this would, in turn, increase women's influence and decision-making at both the household and community levels. As noted above, security in land tenure has been linked to sustainable land management by women, and is, moreover, the avenue through which to achieve land degradation neutrality.

In addition to heavy workloads and lack of formal property rights, rural women farmers are at the forefront of those facing impacts of climate change and variation. These include severe and unpredictable weather patterns that bring new, constant vulnerability for farmers whose livelihoods depend on rain-fed agriculture and predictable weather patterns. Male migration from rural areas also complicates women's sustainable land management as they are left to take up work previously done by the men in addition to their own daily tasks. Cash, the primary driver of male migration, also compels many women smallholders to, themselves, engage in income-generating activities, which further takes away from the time and energy they can invest in sustainable land management.

The international community recognizes the imperative for the sustainable management of land, ecosystems and landscapes, and wherever possible, for their ecological productivity to be restored. The restoration that occurs at the local level in rural communities is tied to gender roles and responsibilities. More specifically, granting gender equality in land ownership, reducing women's workload, enhancing decision-making for women farmers, and building the resource and organizational capacities of women's groups are key components for achieving land restoration, rehabilitation and land degradation neutrality.

Global assessments and commitments, such as the Bonn Challenge – which is a global effort to restore 150 million hectares of the world's deforested and degraded land by 2020 and 350 million hectares by 2030 – will ultimately only be achieved through action and socio-economic change at the local level. The mobilization of women farmers – key stakeholders in grassroots land management – for environmental protection and gender equality are important avenues of socio-environmental resilience. The Chipko Movement in India and the Green Belt Movement in Kenya are two well-known and powerful examples that can serve as models and inspiration for expanding smallholder farmer engagement in achieving the global goal of land degradation neutrality by 2030.

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