



## CGIAR GENDER Impact Platform · Working Paper #012

#### **APRIL 2023**

# Beyond crops: Toward Gender Equality in Forestry, Fisheries, Aquaculture and Livestock Development

By Marlène Elias, Haley Zaremba, Katie Tavenner, Catherine Ragasa, Ana Maria Paez Valencia, Afrina Choudhury and Nicoline de Haan



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#### **ABOUT THIS SERIES**

This working paper, produced by the CGIAR GENDER Impact Platform, is one in <u>a series of analytical</u> working papers by our researchers. They were produced to inform the Food and Agriculture Organization of the United Nations to write the 2023 report on the *Status of Rural Women in Agri-food Systems.*\*

These evidence-based papers address key themes important for gender and social equality, and women's empowerment in agriculture and food systems. They each discuss:

- current status and emerging thinking
- the theme's relevance for transformative change toward more inclusive food systems
- the evolution of equality in agriculture and food systems over the past 10 years in low- and middle-income countries
- what has proved effective to ease structural constraints, and promote equality and empowerment
- specific suggestions about interventions, programs and policies that can help make agriculture and food systems more inclusive.

**COVER PHOTO CREDIT:** ILRI/Zerihun Sewunet. *A woman farmer benefits from an improved feed management system introduced by IPMS.* 

#### ABOUT CGIAR GENDER IMPACT PLATFORM

Generating Evidence and New Directions for Equitable Results (GENDER) is CGIAR's impact platform designed to put gender equality at the forefront of global agricultural research for development. The Platform is transforming the way gender research is done, both within and beyond CGIAR, to kick-start a process of genuine change toward greater gender equality and better lives for smallholder farmers everywhere. gender.cgiar.org.

<sup>\*</sup> FAO. 2023. The Status of Women in Agri-food Systems. Rome.

#### DISCLAIMER

This working paper has gone through a process of nonblinded peer review by two reviewers external to the CGIAR GENDER Impact Platform, and has also been reviewed by the FAO team working on the 2023 FAO report on the *Status of Rural Women in Agri-food Systems*. The views expressed in this publication are those of the author(s) and do not necessarily reflect the views or policies of the Food and Agriculture Organization of the United Nations nor of the CGIAR GENDER Impact Platform.

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## TABLE OF CONTENTS

Abstr	act		v		
1.	Introduction				
2.	New lenses on gender in aquaculture, fisheries, forestry and livestock				
3.	Gender matters in aquaculture, fisheries, forestry and livestock sectors				
4.	Gender gaps in the aquaculture, fisheries, forestry and livestock sectors				
	4.1	Forestry	5		
	4.2	Fisheries and aquaculture	9		
	4.3	Livestock	12		
5.	Strategies and initiatives to close the gender gap				
	5.1	Agency	15		
	5.2	Access to and control over resources	16		
	5.3	Social norms	16		
	5.4	Policies and governance	17		
6.	The promise of closing the gender gap				
7.	Key policy messages and recommendations				
Refe	rence	S	27		
Anne	x and	glossary (available online)	46		

# Abstract

The fisheries, aquaculture, forestry and livestock sectors are critical for sustaining rural livelihoods and achieving food and nutrition security around the world. Yet each of these sectors produces and sustains important gender and other social inequalities, hindering people who rely on these livelihood systems from achieving their full potential. Drawing on Njuki et al.'s (2021) Gendered Food Systems framework, we examine gender gaps in relation to each sector, their implications for achieving multiple food system outcomes, what has worked to reduce inequalities, and the potential these sectors hold for advancing gender equality as an outcome in itself. We demonstrate that, despite specificities across sectors, similar gender barriers limit the benefits women receive from fisheries, aquaculture, forestry and livestock. These constraints, which occur at multiple levels, include: the invisibility and undervaluation of rural women's labor and their disproportionately heavy labor burdens, limited and precarious control over resources, norms that hinder women's voice and influence in decision-making and governance, and exclusionary institutions such as resource-user groups and extension and data systems. We demonstrate that, to achieve transformative change in food systems, changes are required in women's agency, access to and control over resources, gender norms, and policies and governance. Such changes can improve dietary outcomes, gender equality and women's empowerment, economic and livelihood outcomes, and environmental outcomes. To conclude, we argue that closing gender gaps across these sectors requires multipronged strategies that simultaneously engage these four change pathways to lift structural barriers to inequality.

*Keywords: gender equality, social equality, women's empowerment, food systems, transformation, fisheries, livestock, aquaculture, forestry* 

# 1. Introduction

Fisheries, aquaculture, forestry and livestock are critical to for sustaining rural livelihoods and achieving food and nutrition security around the world. Approximately one-third of the global population, and over 90 percent of people living in extreme poverty—including Indigenous Peoples, ethnic minorities, landless farmers, and others in vulnerable situations— have a close dependence on **forests** for food, fodder, shelter, energy, medicine, income, and more (FAO and UNEP 2020). Furthermore, agroforestry is practiced by almost a third of rural smallholders (Miller, Muñoz-Mora and Christiaensen 2017) on 43 percent of the world's agricultural lands (Zomer et al. 2014). In 2017, **fish** represented almost 20 percent of the average animal protein intake and essential micronutrients for 3.3 billion people; and 800 million people, many of them among the poorest and most marginalized, relied on income from aquatic food value chains (FAO 2020a). The **livestock** sector plays an essential role in maintaining livelihoods and reducing poverty for 1.7 billion people globally, providing income to some 60 percent of rural households, and contributing up to half of agricultural GDP (World Bank 2021a, 5).

Each of these sectors is highly gendered in terms of division of labor, rights to access and control resources and assets, decision-making and benefits. The characteristics of each sector and the contexts within which they are embedded have implications for gender equality and other food system outcomes. The invisibility and lack of value given to the knowledge, labor, and skills of the women, Indigenous Peoples, and socioeconomically marginalized groups engaged in these livelihood systems limit their capacity to participate as legitimate actors in decision-making in matters of resource use, processing and trade, management and governance at multiple scales. Consequently, the benefits they receive in these sectors are limited. In contrast, the full, effective and equitable participation of these groups can increase equality and improve resource management, economic and dietary outcomes.

Drawing on the Njuki et al. (2021) Gendered Food Systems framework (figure 1), this paper examines gender issues in relation to each sector, their implications for achieving multiple food system outcomes, and the potential these sectors hold for advancing gender equality as an outcome in itself. Specifically, we discuss: (a) why and how roles, access to, participation in and benefits from forestry, fisheries, aquaculture and livestock are constrained by gender norms and relations; (b) the status of gender gaps in these sectors; and (c) what has proven effective in reducing these gaps. We focus on the structural gender inequalities that are (re)produced in aquaculture, fisheries, forestry and livestock value chains (figure 1)—issues related to the food environment and consumer behavior are treated in other companion papers of this report.

To structure our analysis, we examine different pathways toward empowerment and gender equality that align with the four quadrants of change (types and areas of change) presented in figure 1<sup>1</sup> —namely, changes in:

- 1. women's agency, through enhanced individual capacities, leadership, voice and influence
- 2. access to and control over resources, including women's improved control over assets, income and information
- 3. gendered social norms, by challenging discriminatory beliefs and traditions
- 4. policies and governance, toward gender-just laws, policies and regulations

<sup>1.</sup> Njuki et al. (2021) cite the Gender at Work (n.d.) framework as a reference for these quadrants of change; and the Gender at Work framework draws from Rao and Kelleher (2005), who adapted it from Wilber (1999).

Findings from each sector are used as evidence for these pathways, and to demonstrate how removing gender inequalities can be a lever for change toward the four food system outcomes presented in figure 1: (i) dietary outcomes, (ii) gender equality and women's empowerment, (iii) economic and livelihood outcomes, and (iv) environmental outcomes. To conclude, we argue that closing gender gaps across the sectors requires multipronged strategies that simultaneously engage these four pathways to lift structural barriers to equality.



Figure 1. Gendered Food Systems framework. Source: Njuki et al. (2021, 2)

# 2. New lenses on gender in aquaculture, fisheries, forestry and livestock

We situate our gender analysis amid several advances in the field of gender in agriculture since 2011. First, there has been a call for intersectional approaches that capture how gender interacts with other social factors to produce differential experiences, inequalities and outcomes (Colfer, Sijapati Basnett and Ihalainen 2018; Tavenner and Crane 2019; Acosta et al. 2022). Challenges to binary thinking are also reflected in an evolution in understanding and in ways of measuring gendered decision-making, knowledge, and asset ownership in relation to agriculture (e.g., the Women's Empowerment in Agriculture Index (WEAI) (Alkire et al. 2013)). This evolution has moved toward a continuum of nuanced and interdependent

processes that may be separate, shared or overlapping among spouses and among other household members (Acosta et al. 2020; Bernard et al. 2020). Likewise, a more sophisticated treatment of access, control, and ownership of resources has illuminated the importance of different perceptions about and types of rights to resources (e.g., Galiè et al. 2015 on livestock, Pehou et al. 2020 on nontimber forest products (NTFPs)), and their implications for socioeconomically marginalized groups.

Movement from commodity-focused production to value chains embedded in food systems (figure 1) has also placed gender relations under a new lens. Gender-responsive value chain development considers: relationships among heterogeneous actors within value chain segments (or nodes) and across segments (Stein and Barron 2017; Stoian et al. 2018); women's entry into higher-return value chains and activities; and potential tensions between value chain activities, and women's domestic and reproductive responsibilities. Analytical frameworks and quantitative and qualitative tools for analyzing gendered value chains have been developed and applied in various countries (Kruijssen et al. 2021). Such analyses move beyond numbers to consider quality of participation—including aspects related to women's voice and influence over resources, their management, and governance (Elmhirst et al. 2017; Ihalainen et al. 2021).

Importantly, the fifth Sustainable Development Goal (SDG 5), ("Achieve gender equality and empower all women and girls") has helped to elevate gender equality and women's empowerment from purely instrumental goals to ends in their own right. Correspondingly, new measures of empowerment in relation to agriculture (Elias et al. 2021a; Quisumbing et al. 2023), fisheries (the Women's Empowerment in Fisheries Index (WEFI) (Ragsdale et al. 2022)) and livestock (Women's Empowerment in Livestock Index (WELI) (Galiè et al. 2019a) are offering comparable and multidimensional indicators of women's empowerment—along with qualitative components (Kruijssen and Newton 2022)—to track progress toward those goals. Innovative qualitative methods such as Photovoice (Simmance et al. 2021), intergenerational life history narratives (Tsikata and Darkwah 2014) and case study methodologies (FAO 2017; Sari et al. 2017; Choudhury et al. 2017) are also being used to understand different dimensions of empowerment.

In research and practice, increasing emphasis has also been placed on understanding and addressing the underlying (systemic) causes of gender inequality (e.g., norms, formal structures) rather than focusing merely on the symptoms of inequality (McDougall et al. 2021; Njuki et al. 2021). Case studies and global comparative qualitative analyses have demonstrated the importance of gender norms in shaping agricultural innovation processes (Badstue et al. 2018; Badstue et al. 2020). Resting on this understanding, gender-transformative approaches (GTAs) that encourage local women and men to critically reflect on and challenge discriminatory gender norms have gained traction amid agricultural interventions (Lecoutere et al. 2022). Relatedly, rather than single solutions, efforts are being made to develop suites of complementary interventions to tackle the root causes of gender inequality and other 'wicked problems' in food systems (e.g., Nikolakis and Innes 2020; Haysom et al. 2019).

These perspectives underpin our analysis.

# 3. Gender matters in aquaculture, fisheries, forestry and livestock sectors

The advances described above foster a more sophisticated understanding of gender in agriculture that supports relevant policymaking and programs. Here, we give evidence for the relevance of addressing gender in the forestry, fisheries, aquaculture and livestock sectors by highlighting some of the multidirectional links between gender equality and other sectoral outcomes, focusing on the four system outcomes presented in figure 1.

Improving gender equality in the management of **trees on farms** by integrating women's priority tree species can lead to more biodiversity and enhanced ecological services (Prabhu et al. 2015), improved household nutrition, and more balanced diets (Vinceti et al. 2013; Ickowitz et al. 2014; Jamnadass et al. 2015). Women's participation in resource-user groups has also been linked to improved **forest** management outcomes (Leisher et al. 2016), whereas women's exclusion and gender inequality have hindered adoption of sustainable practices and sustainability schemes (Pham et al. 2016; Larson et al. 2018). Aspects related to women's empowerment (e.g., control over land, agency and access to information) have been linked to household adoption of climate-smart agriculture practices related to trees (Gumucio et al. 2019). Participation in forest, tree and agroforestry value chains can grant women economic and political opportunities and autonomy by increasing their income, social capital and other resources (e.g., Gumucio et al. 2018; Ihalainen et al. 2021).

Women make up 19 percent of the workforce in **aquaculture**, 12 percent of the global workforce in capture fisheries, and about half of those engaged in small-scale **fisheries** (FAO 2020a). Up to 10 percent of the global population is dependent on fisheries for their livelihoods, and low- and middle-income countries (LMICs) are especially dependent on small-scale fisheries, which are historically overlooked but account for 50 percent of total catch (FAO 2020a). The landed value of the catch by women in small-scale fisheries is estimated at US\$5.6 billion (± 1.5 billion) per year, with an economic impact of US\$14.8 billion (± 4 billion) per year (Harper et al. 2020). Failing to engage women as innovators, entrepreneurs, and managers thus undermines a more dynamic, productive and remunerative fisheries sector (Adam et al. 2021). Initiatives supporting women's capacities in the sector have generated improved food security and development outcomes, and reduced postharvest losses (Harper et al. 2013; Cole et al. 2020). Moreover, greater gender equality in user groups related to fisheries and mangroves has been linked to improved management and governance (Leisher et al. 2016; IUCN 2017).

**Livestock development** provides tremendous potential opportunities for increasing gender equality and women's empowerment, given that women represent an estimated two-thirds (over 1.13 billion) of the world's 1.7 billion livestock keepers (World Bank 2021a). Women's active engagement in livestock value chains and equitable access to support and animal healthcare can improve animal health and livestock productivity (Omondi et al. 2022); give opportunities to increase women's agency at the intrahousehold and community levels (Bullock and Tegbaru 2019); and enhance gender equality in decision-making, division of labor and control over assets (Johnson et al. 2016; Carter et al. 2017; Bain, Ransom and Halimatusa'diyah 2020).

Gender-responsive livestock development has been linked to positive dietary outcomes, including enhanced diversification of household consumption and nutritional status (Gitungwa et al. 2021; Price et al. 2018), positive environmental outcomes through restoration of landscapes (ICRAF 2020) and mitigation of climate change (Farnworth 2015),

and economic and livelihood outcomes via income diversification and market participation (Kristjanson et al. 2014; Quisumbing et al. 2015). Additionally, because women-controlled livestock species (commonly poultry, rabbits, pigs, and goats) tend to require lower levels of initial inputs than larger scale agricultural and livestock activities, livestock development in these subsectors presents excellent opportunities for increasing incomes and accumulating assets for the world's poorest people, including those from remote (Serra et al. 2022), pastoralist (Flintan 2021), and marginalized ethnic/caste communities (Ravichandran, Rozel Farnworth and Galiè 2021).

# 4. Gender gaps in the aquaculture, fisheries, forestry and livestock sectors

### 4.1 Forestry

Kristjanson et al. (2019) identify 16 types of gender gaps that should be addressed to increase gender equality in forest settings,<sup>2</sup> noting that many of the constraints women face also apply to other socioeconomically marginalized groups. Yet, globally, national forestry laws and policies are largely silent on gender issues or merely provide a statement referring to women's needs (Jhaveri 2020). Likewise, gender and social inclusion issues are often ignored in forestry programs and projects, such as those focused on payments for ecosystem services, climate mitigation or forest landscape restoration (de Siqueira et al. 2021; Elias et al. 2023).

The inadequacy of qualitative and quantitative data on gender in forestry (Asher and Varley 2018)—particularly from a longitudinal and intersectional perspective—complicates efforts to track change in gender relations over time. Nonetheless, the trends described below should be understood as dynamic, as new income-earning opportunities, formal education, migration, climate change, land-use change, crises such as COVID-19, and other factors drive change in forest landscapes (de Pryck et al. 2018; Hecht et al. 2015; Elias et al. 2021b).

#### 4.1.1 Gender roles

According to FAO's (2020b) Global Forest Resources Assessment, in 2015 the total number of employees in forestry and logging in 71 countries that reported gender-disaggregated data was estimated at 3.88 million, of whom 58 percent were men and 42 percent were women.<sup>3</sup> However, this is considered a massive underestimate (Lippe, Cui and Schweinl 2021) because much of the trade and use of forest products, and particularly of NTFPs, is informal—subsistence-oriented, unregulated, unreported and unaccounted for (FAO 2020b).

<sup>2.</sup> These are gender gaps related to: participation, leadership, tree- and land-tenure rights, forest use, division of labor and workloads, skills, ecological knowledge, access to technology and inputs, access to information, access to benefits, control over project benefits and income, access to credit, access to markets, access to employment opportunities, and policy engagement.

<sup>3.</sup> These figures include the production of roundwood for manufacturing industries, the collection and extraction of NTFPs, timber, and products that require little processing, such as fuelwood, charcoal and wood chips. The figures exclude employment in forest-based manufacturing industries.

Gender norms underpin the division of labor in forestry and agroforestry. In their multicountry analysis, Sunderland et al. (2014) substantiate what numerous studies and reviews have demonstrated (Sun et al. 2011; Souto and Ticktin 2012; Stloukal et al. 2013; Faridah et al. 2017): strong gender specialization in the gathering and processing of most forest product categories, and relatedly, gendered knowledge systems.<sup>4</sup> For instance, women in Asia and Africa are primary knowledge-holders and gatherers of edible wild plants (Müller, Boubacar and Guimbo 2015; Kimanzu et al. 2021), whereas men dominate hunting, timber harvesting and logging (Sunderland et al. 2014; World Bank 2021b), which are associated with masculinity (Colfer 2021).

Yet, global patterns of forest use mask important regional variations. For instance, women are the main collectors of fuelwood in Asia and Africa, whereas men dominate this collection in Latin America (Sunderland et al. 2014). Similarly, a systematic review of data from Africa, Asia, Europe and Latin America shows that gender-based patterns in knowledge of medicinal plants, which are linked to gender roles in plant collection and use, vary with scale (national, continental or global) (Torres-Avilez, Medeiros and Albuquerque 2016). Myriad studies show women's close association with medicinal plants (da Costa, Monteiro Guimarães and Braga Messias 2021)—and at national and continental scales, gender-based patterns in ethnobotanical knowledge are observed in both directions (with women or men holding more knowledge, depending on the context) (Torres-Avilez, Medeiros and Albuquerque 2016). Yet, these differences are not significant at a global scale (Torres-Avilez, Medeiros and Albuquerque 2016).

Gender differences in the collection of forest products are influenced by factors such as the physical demands of the task (climbing trees, heavy lifting, etc.) and where forest products are collected—with social norms underpinning the acceptability of collection by different groups of people (Ingram et al. 2016). Rural men's (generally) greater access to transport (bicycles, motorcycles, carts, horses or trucks) allows them to canvass larger forest areas than women (Kiptot 2015; Elias and Arora-Jonsson 2017). Furthermore, norms and taboos restrict women's movements into certain forest areas due to concerns for their safety (Colfer, Elias, and Jamnadass 2015) and their need to remain near the home to fulfill their socially ascribed domestic responsibilities (Agarwal 2001, 2002; Sunderland et al. 2014).

In their global review of gender relating to forest, tree and agroforestry value chains, Ingram et al. (2016) found a dearth of information on women's and men's participation in the processing and trading stages of forest product value chains, particularly in Asia and Latin America. They note, however, that available data point to women's dominance in both stages. Women are particularly overrepresented in the small-scale NTFP trade, whereas in the studies reviewed, men ran most larger businesses (Ingram et al. 2016).

#### 4.1.2 Access to and control over assets and resources

Over the past two decades, tenure reforms worldwide have devolved forest rights to Indigenous and local communities (Agrawal, Chhatre and Hardin 2008; Larson and Dahal 2012; RRI 2018). Yet, in 2018, more than 70 percent of forestlands—much of which is claimed by Indigenous Peoples and local communities—remained under the legal and administrative authority of governments (RRI 2018). Even when collective tenure is legally recognized, social inequalities influence the capacities of Indigenous and forest-dependent people to secure their forest rights (Banana et al. 2012; Bose 2013; Narváez Guerrero 2014; Bose et al. 2017; Rosman Hernández 2017; Larson et al. 2018).

Rural women's access to and control over land and trees are customarily mediated by their relationship with men (e.g., a husband, father or uncle), and are more limited than their male counterparts' (Mwangi, Meinzen-Dick and Sun 2011; Colfer, Sijapati Basnett and Elias 2016; Meinzen-Dick et al. 2019). Given tenure insecurities, rural women are often prohibited from planting trees, as this can be considered a claim to land (Kiptot and Franzel 2012; Colfer et

<sup>4.</sup> Sunderland et al. (2014) categorize forest products as: firewood, charcoal, food (plants and mushrooms), structural and fiber, medicine, resins and dyes, food (animals), fodder and manure, and others.

al. 2017). Limited control over their own land contributes to the heavy reliance on forests for women and landless households (FAO and UNEP 2020).

Gender intersects with other social factors, such as marital and residence status, to shape who can plant, harvest or fell trees. For example, in some Peruvian communities, widows or divorced women may lose rights to extract Brazil nuts from community forests (Monterroso et al. 2019). In Burkina Faso, rights to access néré (*Parkia biglobosa*) products follow a hierarchy based on women's lineage, order of marriage (in polygamous households), and migrant or resident status (Pehou et al. 2020).

In an analysis of Indigenous and rural women's community-based tenure rights to forests in Africa, Asia and Latin America, the Rights and Resources Initiative (RRI 2017) found that only 10 percent of the 80 community-based tenure rights analyzed had gender-sensitive provisions for inheritance.<sup>5</sup> Although variations occurred, national laws and regulations on inheritance, community membership, community-level governance, and community-level dispute resolution were consistently unjust and fell below the requirements of international laws and standards, such as those enshrined in the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). Moreover, even when legal provisions support women's tenure rights, customary restrictions commonly prohibit women's ability to secure these rights (Tebtebba 2018; Kristjanson et al. 2019).<sup>6</sup>

As noted earlier, limited access to other types of assets, such as means of transport, also hinder the ability of women and poorer groups to access the forest and transport its products. Lack of access to complementary resources and services, such as credit and extension services ( et al. 2022), further limit their capacity to engage in more remunerative tree-based enterprises (Martini et al. 2011; Catacutan and Naz 2015; Davis, Franzel and Spielman 2019).

#### 4.1.3 Decision-making

Despite reforms devolving forest rights to local communities (FAO 2016a), the voice and influence of communities over their forest resources remain questionable (RRI 2014; FAO 2016b). Within communities, too, collective resource management institutions reinforce power inequalities and (re)produce exclusions based on gender, caste or landlessness (Beck and Nesmith 2001; Agarwal 2010; Chomba, Treue and Sinclair 2015; Astuti and McGregor 2016; Sijapati Basnett 2016; Maukonen, Donn and Snook 2020). In most forest contexts, patriarchal and gerontocratic (roughly, 'rule by elders') norms limit the voice of women and young people in forest governance (Agarwal 2002; 2010; IFAD 2016). Limited claims to land and forest products, time poverty, scarce access to information and to influential social networks, mobility constraints, and a lack of value given to their work and knowledge about the forest contribute to women's exclusion from public spaces and decision-making (Agarwal 2001; Sunderland et al. 2014; Stiem and Krause 2016). Women's participation in decision-making processes is greater, however, where education levels are higher and there is less income inequality (Coleman and Mwangi 2015). Normative constraints additionally hinder women's representation in higher level government and policymaking institutions mediating forest governance (Bandiaky-Badji 2011; Pham et al. 2016), including forest agencies (Colfer 2021; Kristjanson et al. 2019).

Sunderland et al. (2014) note significant disparities in women's and men's participation in formal forest-user groups. Women's participation is highest in Africa, followed by Asia and finally Latin America—but women in about half of the households interviewed did not participate in forest-user group meetings at all. Even when women and socially marginalized groups are formally represented in forest-user groups and their committees, they often lack

<sup>5.</sup> Community-based tenure rights refer to the "set of national, state-issued laws and regulations governing 'all situations under which the right to own or manage terrestrial natural resources is held at the community level" (RRI 2017, p7). These community-based tenure rights more closely mediate Indigenous and rural women's interactions with forests than national laws (RRI 2017).

<sup>6.</sup> Women are also globally underrepresented in forestry research, which is considered a masculine discipline (Macinnis-Ng and Zhao 2022).

influence over decision-making processes (Agarwal 2001; Baynes et al. 2015), including those related to market-based community conservation schemes, such as Reducing Emissions) from Deforestation and Forest Degradation (REDD+) (Larson et al. 2015; Larson et al. 2018; Sarmiento Barletti, Hewlett and Larson 2019; Kristjanson 2020).

Despite these challenges, women find ways to exercise agency and influence forest- and tree-management decisions. For example, some form of consultation or negotiation among spouses usually guides decisions to plant or selectively retain trees on smallholder farms in Kenya (Crossland et al. 2021) and Burkina Faso (Elias 2015). Grassroots women's groups have also long been involved in forest conservation and tree-planting initiatives, and are increasingly recognized as key stakeholders (RRI 2018; Jahveri 2020; Killian and Hyle 2020) as women's federations, forestry federations, and local women and men champions advocate for the need to address gendered power relations in forest tenure reforms (Jhaveri 2020). Women are also gaining new opportunities to participate in community-based governance and forestry in some landscapes experiencing high rates of male outmigration (Giri and Darnhofer 2010a). Yet, such gains are fragile because return migration can reinstate previous decision-making patterns (Hecht et al. 2015), at the same time as other gendered barriers to accessing credit, extension, and information continue to hinder rural women's opportunities (Quisumbing, Meinzen-Dick and Njuki 2019).

#### 4.1.4 Benefits

Forest and tree-based foods, which carry essential nutrients, are particularly important for poorer households and for women in their role as food providers, especially during times of hardship and in the 'lean' season when other sources of food and income are in short supply (HLPE 2017; FAO and UNEP 2020). In many remote areas, the sale of NTFPs is also the only source of income available to women (Shackleton et al. 2011). Yet as a general global trend, compared to men, women: are confined to less profitable forestry value chains; occupy less remunerative nodes (such as harvesting and retailing) of these chains; run smaller businesses; and tend to have fewer 'vertical' connections (Ingram et al. 2014; Rubin and Manfre 2014; Haverhals et al. 2016; Gumucio et al. 2018; Ihalainen, Schure and Sola 2020; World Bank 2021b).

Women's involvement in tree-product markets is hindered by a lack of access to capital, cultural norms and taboos, restricted mobility and time deficits. Because men tend to trade in higher volumes and higher value products than women, they earn higher profit margins (Ingram et al. 2014). In Africa, for example, women sell up to seven times less agroforestry products than men by volume (Kiptot 2015; Ingram et al. 2016). In Latin America, men reap the vast majority of the benefits from timber, rubber and cacao value chains, and women are often paid less for their work and their products, even in the same markets (Gumucio et al. 2018). Even when women are involved in the same forest-related enterprises as men, women tend to work in positions with lower associated status and remuneration. In Liberia, for example, only eight percent of forest-related nonfarm enterprises were solely owned by women (compared to 37 percent for men), while women were more represented in sole management (37 percent) than men (33 percent) (World Bank 2021b). This suggests a discrepancy in women's control over an enterprise's income, which is likely to be determined by the owner (World Bank 2021b).

Markets are expanding for some specialty tree products such as shea nuts, which rural women have traditionally collected and processed into butter. In Burkina Faso, as shea exports rose from US\$3.1 million in the early 2000s to nearly US\$19.3 million in 2012, local sales prices nearly doubled (Rousseau, Gautier and Wardell 2017). The rising value of shea offers new prospects for the approximately 16.2 million shea collectors who inhabit the Sudano-Sahelian zone, from West to East Africa (Naughton, Lovett and Mihelcic 2015). Yet, such market changes can also pose risks to women's livelihoods, as more powerful and better connected (male) actors become involved in the trade of products customarily under women's purview (Ingram et al. 2015; Rousseau, Gautier and Wardell 2019). The drudgery associated with processing many forest products such as shea nuts, a lack of processing equipment and machinery, and of knowledge and skill to generate a quality product in required quantities

also limit rural women's returns and capacity to access higher value markets (Jasaw, Saito and Takeuchi 2015; Elias and Arora-Jonsson 2017).

Amid forest degradation, climate changes affecting crop production, men's outmigration, and the lack of alternative livelihood options, some women—particularly in women-headed households in various African countries—are venturing into traditionally male-dominated value chains like charcoal production (Djoudi and Brockhaus 2011; Evans 2014; Ihalainen, Schure and Sola 2020). This creates opportunities for increased income and autonomy, but can also expose women to exploitation and stigmatization (Ihalainen, Schure and Sola 2020).

Finally, new markets to compensate communities for preserving ecosystem services, such as through payments for ecosystem services (PES) and REDD+, have tended to reinforce rather than challenge gender inequalities. In Larson et al.'s (2018) six-country study of 62 villages participating in 16 REDD+ initiatives, compared to men, rural women knew much less about the program, had little voice in local REDD+ decision-making processes, and experienced a much greater drop in their subjective well-being over time. Importantly, when payments for carbon sequestration and other ecosystem services are tied to formal land or resource ownership, women or youth who are not registered on titles have been excluded from benefits (Sunderlin et al. 2018; Kariuki and Birner 2021; Tseng et al. 2021).

## 4.2 Fisheries and aquaculture

Primary fisheries and the aquaculture sector employ an estimated 60 million people worldwide, and around 800 million people are engaged across different stages of aquatic food value chains (FAO 2020a). Yet global and most national fisheries policies are genderblind (Gopal et al. 2020). Moreover, women's engagement in aquaculture and fisheries, while considerable, is often overlooked and unrecognized in national statistics (Kleiber, Harris and Vincent 2015; Choudhury et al. 2017; Gopal et al. 2020; Harper et al. 2020; FAO 2020a). Looking at the 10-year span between FAO's State of World Fisheries and Aquaculture (SOFIA) reports in 2010 and 2020, lack of sex-disaggregated data in fisheries persists; and statistics on inland fisheries and postharvest activities, where women tend to be concentrated, remain underreported (Kleiber, Harris and Vincent 2015; Choudhury, Rajaratnam and McDougall 2022). Furthermore, official statistics obscure the activities of small-scale fishers, who share and exchange much of their fish informally and in local markets, and may consume a significant portion of their harvest (Arthur et al. 2022).

#### 4.2.1 Gender roles

Despite its limitations, the literature and data on gender, aquaculture and fisheries reveal important patterns. First, data shows that both fishing and fish farming are dominated by men. Globally, only 14 percent of (primary sector) fishers and fish farmers overall are women (FAO 2020a). Men dominate offshore and high-value fisheries, but women are disproportionately involved in the harvesting and gleaning (a specific fishing method used in shallow coastal, estuarine and freshwaters waters; or in habitats exposed during low tide) of shellfish and invertebrates (Kleiber, Harris and Vincent 2015; Furkon and Ambo-Rappe 2019). Although participation rates vary regionally, women comprise 47 percent of the global labor force in small-scale fisheries, which garner much less visibility than industrial fisheries (World Bank 2012).

Second, gender roles in fisheries and aquaculture are diverse, context- and culturally specific, and often species-specific. Gender norms, such as taboos against women in Bangladesh entering bodies of water (Adam et al. 2021) and cultural norms that women in Malawi should not spend too much time outside the home (Nagoli, Binauli and Chijere 2019), discourage women's engagement in these activities. In many countries, fish farming is still largely perceived as men's work, and women's engagement is limited (Kruijssen, McDougall and van Asseldonk 2018; Brugere and Williams 2017; Ragasa et al. 2022a). Yet the relationship between gender and aquaculture or fisheries value chains is dynamic and continuously changing due to factors including new technologies (Gopal, Edwin and Meenakumari 2014), climate change, overexploitation of marine resources, and human migration. In the past

decade, a proliferation of development projects promoting homestead or community ponds/ tanks (e.g., Farnworth et al. 2016) has supported the increased engagement of poor women in aquaculture (TCI 2019). Still, despite a growing number of women's group aquaculture enterprises and a growing role for women in industrial fisheries (FAO 2013), women generally remain disadvantaged throughout the fish value chain, with their productive potential unrealized (FAO 2013; UN Women 2018).

Third, when all stages of the value chain are included, women are estimated to make up half of the global primary and secondary aquaculture- and fisheries-sector workers (Funge-Smith and Bennett 2019), but there is occupational segregation at different nodes of the value chains. Men tend to be involved in the harvesting stage in both capture fisheries and aquaculture (as of 2014, 81 percent of harvest-level workers were men), whereas women are overwhelmingly involved (90 percent) in secondary (postharvest) activities, such as fish processing and marketing (UN Women 2018).

In the processing node, women comprise between 50 and 100 percent of the workforce in aquaculture and fisheries (Kruijssen, McDougall and van Asseldonk 2018; Brugere and Williams 2017). Small-scale processing operations often take place as a backyard informal activity (Kleiber, Harris and Vincent 2015; Harper et al. 2020) using low-cost and often suboptimal techniques, including smoking, salting, and open-air sun drying (Adeogun and Adeogun 2015; Tesfay and Teferi 2017). In medium- and large-scale processing, women make up the majority of the workforce, but are largely confined to low-skilled, low-paid, and often informal, seasonal and part-time jobs; whereas men are more commonly involved in skilled and managerial full-time work (UN Women 2020). As a result, women receive fewer job benefits and experience higher risk of exploitation (UN Women 2020). In larger scale global seafood ventures, women are outnumbered in director roles: they range from two percent of directors in Chile and Japan to a high point of 31 percent in Norway (UN Women 2018).

The involvement of women in aquaculture and fisheries trading is more visible and better documented than in primary production. The proportion of women involved in trading widely differs by country: from 0 percent reported in Bangladesh to 99 percent in Nigeria (Farnworth 2015; Kruijssen, McDougall and van Asseldonk 2018). Even within a country, women's participation can vary widely. For example, in Nigeria, women play important roles across the value chain in all surveyed states except Kano (where, possibly due to cultural and religious differences, men dominate almost all value chain activities) (Subasinghe et al. 2021). At the trading node of the value chain, there is a stark difference between women and men traders in terms of fish species traded, hours worked, volume of fish traded and more. Women tend to sell a narrower variety of fish species, in lower volumes, and to have lower profits (Farnworth 2015; Kruijssen, McDougall and van Asseldonk 2018). In Nigeria, businesses owned by women are smaller in size (based on profit) than those of their male counterparts, especially at the processor and retailer levels (Subasinghe et al. 2021). Women generally have less access than men to transport, storage facilities, and information on markets, guality standards and regulations. Women traders are also exposed to greater harassment in markets, and 'sex-for-fish' transactions between men fishers and women traders seeking to secure fish for sale are reported in small-scale fisheries in Africa, and to a lesser extent in other regions—exposing women to health and safety risks (Béné and Merten 2008; Farnworth 2015; Fiorella et al. 2015; El-Azzazy 2019).

#### 4.2.2 Access to and control over assets and resources

Women face serious disadvantages in access to fisheries and aquaculture resources along the value chain; their assets are both fewer and of lesser value than men's (Kruijssen, McDougall and van Asseldonk 2018). In Bangladesh, for example, women own less than one percent of fish ponds (Jahan et al. 2015) and two percent of fishing boats and nets (Momtaz, Asaduzzaman and Kabir 2021). In Zambia, men were significantly more likely than women to report sole ownership of locally produced fishing equipment, externally produced fishing equipment, and canoes (Ragsdale et al. 2022); and in Ghana, while some women producers are starting to manage fish farms, ownership of the land (and fish ponds) is still in their husband's name (Ragasa et al. 2022b). Postharvest, small-scale fishers, processors and traders largely lack access to cold storage technology to keep fish fresh; but here too, gender disparities exist (FAO 2017, cited in UN Women 2018). Lack of access to storage, among other factors, leads to significant postharvest losses, which are more pronounced among women than men (Nordhagen 2021). For example, in a case study in Zambia, women lost between three and eight times more fish by volume than men, depending on their stage in the chain (Kaminski and Cole 2017). Barriers to accessing transport, information, credit and financial resources, and entrepreneurial support further limit women's enterprises in this sector (UN Women 2018).

#### 4.2.3 Decision-making

Globally, discriminatory norms, customs, laws, and regulatory mechanisms tend to lock women out of decision-making spaces and relegate them to lower, informal nodes of the fisheries and aquaculture value chains (Weeratunge-Starkloff and Pant 2011; Mangubhai and Lawless 2021). This leads to women's underrepresentation in fish farmer groups and fisheries networks (Weeratunge-Starkloff and Pant 2011). Even in activities that are dominated by women, men often make the decisions. For example, in a study in Zambia, men had more decision-making input in fishing, processing, transporting and selling fish, even though selling fish was the primary occupation of women surveyed (Ragsdale et al. 2022). One-fifth (20.1 percent) of women reported little to no decision-making power in this activity, despite it being considered 'women's work' (Ragsdale et al. 2022).

In the industrial fishing sector, management is overwhelmingly male dominated (UN Women 2018). Merely two percent of the maritime industry workforce are women, and women are largely absent from decision-making positions (MacNeil and Ghosh 2017, cited in UN Women 2018). In 2016, only one of the top 100 seafood companies was run by a woman (FAO 2016c, cited in UN Women 2018), and 55 percent of seafood companies analyzed had no women as directors or on their boards (UN Women 2018).<sup>7</sup>

#### 4.2.4 Benefits

Limitations on women's upward mobility in fisheries and aquaculture value chains result in an uneven allocation of benefits, with women's labor often viewed as an extension of their unpaid domestic duties (Weeratunge-Starkloff and Pant 2011). Even when men and women are working in the same capacity with the same product, women's incomes are often lower. Gender-based income disparities range from 10–20 percent in fish and shrimp farming in Bangladesh to 46 percent of net profits in fish retailing in Egypt (Kruijssen, McDougall and van Asseldonk 2018).

In many countries, few women are involved in aquaculture production, and those involved are primarily working in homestead and small plots with low-value fish species (Brugere and Williams 2017; Kruijssen, McDougall and van Asseldonk 2018). While there are increasingly well-off women who engage in aquaculture production and input supply, these are rare cases (Ragasa et al. 2022b). In many countries, gender norms restricting women's activities outside the home make it difficult to deliver training, services, resources, and other support to women fish farmers, and restrict their membership in organizations and associations (Ragasa et al. 2022b; Kruijssen, McDougall and van Asseldonk 2018).

Despite women's dominance in fish processing, they are paid less overall than men (Kruijssen, McDougall and van Asseldonk 2018), although it is not clear from the analyses whether the difference applies to jobs of the same type and nature. Women are particularly poorly paid or unpaid in small-scale processing (UN Women 2018). While women are very active in fish trading, the intensity and quality of their involvement and the benefits derived depends on the type of fish traded and the season (Kruijssen, McDougall and van Asseldonk 2018). With few exceptions, women traders are generally concentrated in segments of the value chain that focus on lower value fish (dried and small fish). They work fewer hours per day in fish

<sup>7.</sup> This analysis was of 68 of the top 100 seafood companies. Data on the board composition of the other 32 companies was not available.

retail, and their firms tend to sell a narrower variety of fish species and often deal with lower volumes, resulting in lower profits than men (Kantor and Kruijssen 2014). Differences also occur *within* gender groups; for example, women traders in Nigeria have unequal access to fish after harvest, with richer women often carrying much more influence with fishermen (Akintola and Fakoya 2017).

## 4.3 Livestock

Echoing the findings from the forestry and fisheries and aquaculture sectors, despite women's considerable contribution to livestock development, livestock national policies continue to be largely gender-blind across regional contexts (e.g., see Aregu et al. 2016 on Ethiopia; and Global Forest Coalition 2021 on Bolivia, Nepal, Paraguay and Togo). Moreover, there is a dearth of robust global-, regional- and national-level datasets that document women's ownership, decision-making, and participation in livestock production. At present, most gender and livestock studies focus on a single country or case study, as opposed to systematic or global reviews and multicountry studies. Given these significant data gaps, the livestock findings presented below generally refer to a single country or case study example, or review papers on specific topics related to livestock development (e.g., design of genderresponsive livestock interventions, in Chanamuto and Hall 2015), unless otherwise specified. There is also little data that captures women's full engagement in different markets and value chain nodes within the livestock sector. For example, because women are often more involved in informal than formal markets (Hovorka 2012; Njuki and Sanginga 2013), their contributions may be underreported and data only partially representative of their realities of working in the sector. Furthermore, in cases where women's participation in livestock activities is considered socially inappropriate or illegal, obtaining reliable data is difficult and presents ethical challenges for researchers (Tavenner, Crane and Saxena 2021).

#### 4.3.1 Gender roles

Rural women represent two-thirds of the world's poor livestock keepers,<sup>8</sup> and carry out most of the day-to-day farm animal management, processing, marketing, and sale of animals and their products (FAO, 2012). Women play a dominant role in small livestock production and marketing (Herrero et al. 2013). As the main users and caretakers of locally adapted livestock breeds, they are also preservers of livestock diversity (Köhler-Rollefson 2012).

Gender roles, responsibilities, and constraints in livestock value chains vary based on the type of livestock species/product (Hovorka 2012) and production system (e.g., pastoral, smallholder or commercial) within the local sociocultural context (Tavenner and Crane 2018). However, across systems, customary gender roles are often biased (Serra et al. 2018). Gendered social meaning, which ascribes power and positioning for women and men in local livestock systems (Serra et al. 2018), frames the gendered division of labor within a livestock subsector. For example, the most powerful and profitable breeds of livestock (e.g., cattle, camels and buffalo) are often ascribed 'masculine' social power and their care and control dominated by men; whereas other, less powerful, less profitable livestock breeds (e.g., poultry and small ruminants) are given 'feminized' meaning and are considered more culturally acceptable for women's engagement (Hovorka 2012).

The result of these cleavages are clearly defined gender roles in livestock production, which underpin routine management tasks such as livestock grazing (Najjar and Baruah 2021) and livestock feeding (Harris-Coble et al. 2022), as well as gender-differentiated knowledge about zoonotic disease transmission (Kinati and Mulema 2018). This division of labor relies heavily on women's unpaid labor, including for the demanding tasks of harvesting fodder (Njuguna-Mungai et al. 2022) and fetching water for cattle in intensified dairy production (Ransom et al. 2017). Amid rapid current changes in agricultural systems, technological change in the livestock sector has strong gender and labor implications, as it typically involves

<sup>8.</sup> For a detailed accounting of the facts behind these figures and to contextualize the origins of this statement, see MacVicar (2020).

renegotiation, reassignment or deepening of roles and responsibilities within households, which can alter traditional patterns of access to resources such as milk, land, and income (Gallina 2016).

Recent studies elucidate how gender and other intersectional identities—including age (Bullock and Crane 2021), marital status (Tavenner and Crane 2019), ethnicity (Serra et al. 2022), and caste (Ravichandran, Rozel Farnworth and Galiè 2021)—mediate gender roles and power relations in livestock development. Ravichandran, Rozel Farnworth, and Galiè (2021) further show that, while gender and caste norms restrict women's inclusion and control over dairy income in India, dairy cooperatives that have sought to empower women of all castes and successfully engage men as supporters were able to inclusively support women's empowerment. Evidence on how gender and intersecting social norms shape asset ownership, decision-making, and benefits associated with livestock production (Galiè et al. 2022; McKune, Serra and Touré 2021; Tavenner and Crane 2018) has shed light on pathways to women's empowerment in livestock systems. The fluidity of gender norms has also been evidenced by the circumvention of patriarchal norms in masculinized production systems (Tavenner, Crane and Saxena 2021).

#### 4.3.2 Access to and control over assets and resources

Livestock are an important resource for many rural households, and livestock ownership has been identified as a pathway out of poverty for women when it allows them to secure current and future assets (Kristjanson et al. 2014). Multiple studies (Galiè et al. 2019b; Marsh et al. 2016; Johnson et al. 2016; Price et al. 2018; Bain, Ransom and Halimatusa'diyah 2020; Gitungwa et al. 2021) have showcased that when women have access to and control over livestock assets, they have greater capacity to improve the health, education and food security of their households. However, while there is variation based on local sociocultural contexts, there are significant global gender gaps in livestock assets and associated resources needed for production (Serra et al. 2018). These include gaps in land ownership and access to: pastures (Flintan 2021; ILRI 2021a, 2021b), fodder and forages (Njuguna-Mungai et al. 2022), water (Ransom et al. 2017), credit (Silong, Fada, and Gadanakis 2019), technology and information (Patel et al. 2016) and veterinary services and products, such as vaccines (Namatovu, Campbell and Ouma 2021; Acosta et al. 2022)

Significant progress has been made to measure, monitor and evaluate these gaps, such as by using the project-level WEAI (pro-WEAI) (Malapit et al. 2020) and the Women's Empowerment in Livestock Index (WELI) (Galiè et al. 2019a; Colverson et al. 2020; McLeod, Galiè and Baltenweck 2021; Quisumbing et al. 2023). The WELI departs from traditional survey methods for measuring women's empowerment by advocating for the use of complementary participatory and qualitative methods to provide context-specific insights on the processes of women's empowerment in the livestock sector (Galiè et al. 2019a). Using these mixed methods has enabled more nuanced evidence of women's empowerment beyond an aggregated indicator score to include discussion of women's perceived empowerment. For example, a WELI-based study of pastoral communities in Tanzania (Galiè et al. 2019b) revealed that women's perceived claims of control over livestock resources may be more relevant in the local context than aggregate 'ownership' scores. These evolutionary changes in measurement reflect an understanding that local meanings of livestock ownership can reveal important and unnoticed aspects of resource allocation, and provide guidance for locally relevant approaches to improve gender equality (Galiè et al. 2015; Dumas et al. 2018).

#### 4.3.3 Decision-making

The gender inequalities embedded in localized sociocultural norms around livestock and in access to and control over resources influence decision-making at the intrahousehold, community and local institutional levels. Within the household, these inequalities intersect with the relative positioning of women—for example, between mothers- and daughtersin-law; between older and younger women; and in polygamous cultures, among co-wives (Tavenner and Crane 2019). Gender inequalities in access to markets and weak linkages to value chain actors due to low literacy levels and marketing skills, inequitable work burdens, and mobility restrictions also affect women's ability to make informed choices in livestock marketing (Jimah and Fischer 2021) and to control income from the sale of livestock and value-added products (Tavenner et al. 2019).

Recent research has drawn attention to the complexities of intrahousehold decision-making in the livestock sector, highlighting both complementary (Flintan 2021) and conflicting (Hillesland, Doss and Slavchevska 2020; Tavenner et al. 2018) dynamics between spouses. Moreover, gender differences in the types of livestock decisions (e.g., decisions for household consumption of livestock and their associated products versus decisions on the sale of livestock) have been observed (Carter et al. 2017; Basu, Galiè and Baltenweck 2019; Bonis-Profumo et al. 2022). For example, in a study of over 5,000 East African smallholder farmers, women had far greater control over decisions related to consumption than over decisions related to sales. This difference was less pronounced for lower value and feminized livestock products such as poultry and eggs. The study suggested that as livestock sales increase, women's control over these sales may diminish, regardless of specific type of livestock (Tavenner et al. 2019).

To mitigate these potential negative impacts on women's decision-making, gender-responsive training on livestock management has supported women's involvement in decision-making and normative change related to the distribution of household income (Quisumbing et al. 2015). Furthermore, women's participation in self-help groups and women-led agricultural collectives have provided pathways to women's empowerment by increasing their economic independence, control over their income, and livestock-related decision-making at both the household and community levels (Rewani and Tochhawng 2016).

#### 4.3.4 Benefits

Taken together, the persistent global and localized inequalities in gender norms, assets, and decision-making within the livestock sector discussed above constrain many women's ability to participate in, benefit from, and be empowered through livestock development. The potential benefits women can derive from livestock production and marketing—including increased economic empowerment and independence (Basu and Galiè 2021), improved nutritional and food security outcomes (Feed the Future Innovation Lab for Livestock Systems 2020; Price et al. 2018), and resilience to climate change (Acosta, Nicolli and Karfakis 2021)—are buffered by these constraints.

The gender gap in income derived from livestock sales has been the most documented (Njuki and Sangina 2013; Baltenweck et al. 2021). The size of the gap appears to differ based on the livestock species/product, as well as the level of commercial orientation. For example, women are customarily better able to control income from the sale of sheep, goats, pigs, rabbits, guinea pigs, poultry, eggs, and milk than from the sale of larger ruminants (Chanamuto and Hall 2015); and are more likely to farm local breeds (Köhler-Rollefson 2012). These locally adapted breeds, which are likely more climate resilient, hold potential for women's resilience amid climate changes (Chanamuto and Hall 2015). When livestock production intensifies and farmers become more commercially oriented, however, women tend to lose control over customarily controlled livestock species/products (Chanamuto and Hall 2015). For example, in a study of smallholder households in Ethiopia, Kenya and Tanzania, women's control over income from livestock products displayed a significant negative correlation with the value of income generated from each individual farm product (Tavenner et al. 2019). This strongly suggests that the more economically lucrative a farm product becomes, the more likely men are to control income from that product.

# 5. Strategies and initiatives to close the gender gap

Several types of policy, programmatic and civil society initiatives have sought to redress these gender and social inequalities, but there is limited rigorous empirical evidence of the impacts these initiatives have on gender equality or of their sustainability. Of the few impact studies available, many demonstrate methodological challenges and their estimates have high risk of bias (Gonzalez Parrao et al. 2021). Many of these studies are project documents or analyze small samples or cherry-picked cases.

Below, we present strategies and initiatives across sectors that have been reported to 'move the needle' on gender equality in their specific context. They have been selected as examples of change within the four pathways described in the quadrants in figure 1. Although each stem from a particular sector, the approaches they espouse also hold relevance for the other sectors of focus. The cases presented demonstrate that changes along different pathways are mutually reinforcing (e.g., increases in women's agency can improve their control over resources, and vice versa). Additional examples across sectors and pathways are presented in table 1.

Together, the cases highlight the importance of solid partnerships and long-term engagement among a wide array of stakeholders to generate change. Multiple levels of government, policies and public services, nongovernmental organizations, agricultural development projects—and the donors who support them—play essential roles in creating an enabling environment for change. Critically, civil society and collectives, customary authorities, private-sector (producer) organizations, among others, are key actors to advocate for and champion change from the bottom up.

# 5.1 Agency

The field of forestry provides examples of how to strengthen women's individual and collective agency by increasing their active participation in forest-user groups. In India, achieving a 'critical mass' of women participants at forestry meetings increased women's agency (Arora-Jonsson 2012), and having mixed-gender forest-user groups composed of at least one-third women helped women to attend and speak up during meetings and hold office in committees (Agarwal 2015). In a cross-country study, prior participation of women on the executive committees of forest-user groups increased the probability of having women councillors on these boards in the future (Coleman and Mwangi 2015).

Peer-to-peer mentoring and support networks have enabled women to participate and take leadership roles in forestry organizations (Kaaria et al. 2016). Strengthening collective action and creating and/or supporting women-only groups (e.g., self-help or savings and credit groups that may not be directly related to the forest, or subgroups within forest-user groups) have helped women gain self-confidence, capacities, experience in working together, and a sense of collectivity, which they can then bring to mixed forest-user groups (Agarwal 2010, 2015). Similar changes in women's leadership and social empowerment were noted after women engaged in women's self-help groups for livestock rearing in India and Kenya (Rewani and Tochhawng 2016; National Smallholder Poultry Development Trust 2018; Christie and Chebrolu 2020; Mwambi, Bijman and Galiè 2021).

External agencies can play an important role in supporting these groups and promoting the integration and active participation of some of their members in mixed-gender groups to represent women's interests. External actors can also support monitoring of gender equality and benefit-sharing in these groups (Kristjanson 2020). In turn, higher order community forestry

associations or federations have been successful platforms to engage with the government and promote broad structural changes in gender norms and for women's participation in public spaces (Giri and Darnhofer 2010b; Arora-Jonsson 2012; Kristjanson 2020).

### 5.2 Access to and control over resources

In several examples from fisheries, supporting gender-equitable access to agroprocessing technologies not only reduced postharvest losses, but also reduced women's (and, to a lesser extent, men's) time burdens, allowing them to engage in other pursuits (FAO 2013; Akintola and Fakoya 2017; Cole et al. 2018). Providing battery-operated bicycles to women fish traders in India has successfully increased their mobility and facilitated their trade (FAO 2013). Successful nutrition- and gender-sensitive approaches to aquaculture and fisheries have improved women's and children's nutrition security by promoting women's access to: resources and assets, including dried fish powder (Byrd et al. 2021); improved processing technologies (Cole et al. 2018); homestead fishponds (Castine et al. 2017; Thilsted et al. 2016); and integrated aqua-agri-livestock systems (Akter et al. 2020).

Approaches targeting women's collectives have been especially effective for improving women's access to key aquaculture and fisheries resources. In India, a program based on self-help groups helped bolster the nutrition security of households by improving women's access to community aquaculture tanks and nutritious small fish such as sunfish (TCI 2019). Group-based training and credit-provision programs targeting women have improved their participation in aquaculture, their share of benefits, asset ownership relative to their husbands (Quisumbing and Kumar 2011; FAO 2013; Kruijssen, McDougall and van Asseldonk 2018), social capital, mobility, likelihood of having paid work (Hallman, Lewis and Begum 2003, cited in Gonzalez Parrao et al. 2021) and access to credit (Adam et al. 2021).

To close asset gaps and increase the productive capacity of livestock producers and entrepreneurs, gender-responsive livestock-development programs have delivered services and products tailored to the specific needs and preferences of women (McLeod, Galiè and Baltenweck 2021; Rosimo et al. 2018). For example, in Bangladesh, a Bangladesh Rural Advancement Committee (BRAC) program provided ultrapoor women with: livestock such as cattle, goats and poultry birds; intensive training on how to use these assets to generate income; and mechanisms to regain assets sold by husbands without women's permission. This program increased women's *use* rights to these assets, although it ultimately did not increase their *ownership* rights (Roy et al. 2015).

Inclusive access to affordable, reliable and sustainable technologies can also have transformative effects when they free up women's labor and enable access to information and other resources. Solar-powered cold chains (food storage units designed to keep food fresh at markets and on farms) implemented in various countries, particularly in sub-Saharan Africa, are promising technologies that can reduce fish food loss, support climate resilience, improve market efficiencies, reduce workloads and increase profits to women and men vendors (Efficiency for Access 2020; Takeshima et al. 2021). Further monitoring and rigorous evaluation of technology-transfer initiatives will be important to ensure and sustain positive impacts on women's welfare and empowerment.

## 5.3 Social norms

Because gender norms and relations, as well as women's empowerment, critically shape food environments and diets (HLPE 2017; Lecoutere, Kosec, et al. 2023), several initiatives have focused on shifting discriminatory gender attitudes and norms across the sectors of focus (Kantor, Morgan, and Choudhury 2015) (table 1). For example, in India, a behavior-changecommunication campaign successfully challenged norms prescribing women's seclusion to enable more women fish traders to use public transport (FAO 2013). In Bangladesh, combining social–technical innovations involving women-targeted technology and GTAs that prompted community members to critically reflect on discriminatory gender norms allowed women to overcome a double barrier to participating in aquaculture: lack of gender-appropriate fishing equipment, and social norms classifying aquaculture as 'men's work' (Adam et al. 2021; Choudhury and Castellanos 2020). This resulted in women's increased involvement in aquaculture, and improved household nutrition security through greater access to nutritious small fish (mola) (Choudhury and Castellanos 2020).

Still in Bangladesh, engaging husbands and wives together in training on prawn polyculture (simultaneous cultivation of two or more compatible organisms in a single area) challenged existing gender norms, and an evaluation of the program suggested that its positive average effect on women's empowerment indicators was likely due to its household approach (DANIDA 2008, cited in Gonzalez Parrao et al. 2021). In India, the creation of 'contact zones,' where different gender and social groups engaged in dialogue and social learning about gender relating to collective forest management, helped to create mutual respect and appreciation across gender and caste groups, as well as leveling power relations and promoting unity in community-based forest management (Hegde et al. 2017).

Strategies identified as effective in reducing benefit gaps in livestock systems highlight the importance of addressing the root causes of gender inequalities—including harmful gender norms that inhibit women's agency and decision-making power (Bullock and Tegbaru 2019; Mugisha et al. 2020; Mulema et al. 2020). For example, in Ethiopia, the participatory action research method of 'community conversations' was used to shift gender norms that limit women's meaningful engagement in productive roles and their economic empowerment in livestock development (Mulema et al. 2020).

## 5.4 Policies and governance

Despite many calls and recommendations for gender-responsive policies as well as critiques of gender-blind and discriminatory policies (Lecoutere et al. 2022), there is a notable gap in the literature on policies that have worked to enhance gender equality across the forestry, fisheries, aquaculture and livestock sectors. This is reflected below and in <u>annex table 1</u>, which includes examples of promising policies and approaches for enhancing civil society's voice in policymaking, rather than assessments of successful implementation and performance.

Climate change is affecting each of the sectors examined in gender-differentiated ways. The extent to which policies account for these differences, and for women's and men's agency in climate action, varies widely (Bryan et al. 2023). The government of Costa Rica has demonstrated political will and institutional capacity by investing in gender equality in its response to climate change, and biodiversity and forest conservation (Aguilar Revelo 2021; UN-REDD 2021). The country's Nationally Determined Contributions<sup>9</sup> document refers to gender throughout, recognizing the particular vulnerabilities of transgender people, women, persons with disabilities, and Indigenous and Afro-descendant Peoples to climate change (DCC 2020). Costa Rica's gender action plan for its national REDD+ strategy was prepared in consultation with civil society organizations and different groups of Indigenous women and rural smallholder forest producers, resulting in a concrete proposal for social and environmental transformation based on a diversity of needs and priorities. It recognized and identified support for activities through which women are already actively engaged in reforestation, and includes a benefit-sharing plan to improve rural women's incomes and livelihoods while contributing to REDD+ goals (World Bank 2019; Aguila Revelo 2021).

In Southeast Asia, Vietnam and the Philippines have developed specific national and sectoral gender action plans for aquaculture or fisheries (Bosma et al. 2019). The Philippines gender action plans were operationalized by all institutions at each level by defining specific budgets, activities, and monitoring using gender-specific indicators (Bosma et al. 2019).

Implementation was weaker in Vietnam, but aquaculture and fisheries gender action plans have been actively implemented in some provinces, sometimes with the support of a local or a regional project (Bosma et al. 2018).

<sup>9.</sup> In Nationally Determined Contributions, countries outline their proposed actions to reduce greenhouse gas emissions and increase resilience to climate change. Source: 2022 United Nations Framework Convention on Climate Change (https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement).

In the livestock sector in East Africa, institutional advances toward gender equality have been made in pastoral (ILRI 2021b) and commercial livestock systems (CCAFS 2022). In Kenya, commercial dairy-production institutions (including private companies, national- and countylevel milk cooperatives, and women-led producer organizations) have advanced gender equality through gender mainstreaming strategies and the inclusion of women and youth in institutional leadership (Katothya 2017). Kenya's dairy sector's Nationally Appropriate Mitigation Action plan includes the design of private-sector investments in gender-inclusive extension services to increase on-farm productivity and strengthen women dairy farmers' knowledge of climate-smart dairy practices (CCAFS 2022).

Primary pathway of change	Sector	Initiative	Outcome
Agency	Forestry	Adaptive Collaborative Management (ACM) is a collective problem-solving and management approach that supports gender equity in negotiations and decision- making through participatory dialogues among community members and with other actors (Evans et al. 2014; Evans, Larson and Flores 2020).	<ul> <li>In Uganda, intergender dialogues in the context of ACM provided a safe platform for women to be heard in the presence of men without intimidation or retribution. After eight years, ACM resulted in:</li> <li>The proportion of women in executive roles increased from 11% to 54% in a more gender-balanced forum that accounted for women's interests and priorities.</li> <li>Community-based reforestation of degraded forests, women's involvement in the management of these forests, and their enhanced benefits from forest reserves.</li> <li>Increase in women's decision-making, confidence, engagement and agency, including in seeking external assistance.</li> <li>Women's attendance and participation in group discussions increased, from low levels to nearly 1:1 with men and boys, with women's attendance sometimes exceeding mens' (Mukasa et al. 2016).</li> <li>Improved coordination among communities, NGOs, and state forestry agencies (Evans et al. 2014).</li> <li>In Nepal, after eight years, changes resulting from ACM included:</li> <li>Women members of executive committees nearly doubled, from 18 to 34 percent.</li> <li>Among women representatives, poor women experienced the highest increase in numbers, from 31 to 40 percent.</li> <li>Forest-user groups grew their networks and were able to proactively advocate for information, resources and collaboration with external actors (McDougall and Banjade 2015).</li> </ul>

#### Table 1. Examples of initiatives successfully improving gender equality

Primary pathway of	Sector	Initiative	Outcome
<b>change</b> Agency	Fisheries and	The farmer field	In Bangladesh, co-research through women-led fish
	aquaculture	school approach, which centers farmers as the decision-makers and co-experimenters who learn by doing, was adapted to smallholder aquaculture ("fish schools") to assess climate-resilient fish species and other climate-smart innovations adapted to the local context	schools, carried out alongside technical training on cultivation and farmers' development of their own low- cost, local fish feeds, resulted in:
			<ul> <li>Development of low-cost local fish feeds that are considered more climate-friendly and accessible than commercial feeds (Adam et al. 2021).</li> </ul>
			<ul> <li>Women's increased practical knowledge and skills, e.g., pertaining to climate-smart species and best management practices.</li> </ul>
			• Women's direct access to and control over fingerlings.
			<ul> <li>Over 75 percent of women in the study reported positive changes in their household decision-making power, especially with respect to household food security and income.</li> </ul>
			<ul> <li>For some women, a reported decrease in time deficit due to increased access to homestead ponds.</li> </ul>
			• Yet, overall empowerment gains were limited by persistent gendered power differentials and norms within the household (Colgan et al. 2019).
	Livestock	A backward- and forward-integrated producer company fully owned by rural women (National Smallholder Poultry Development Trust 2018)	A new factory in central India for pelleted poultry feed is bringing women from Indigenous communities a step closer to economic and social empowerment. The factory is owned by a federation of 10 poultry growers' cooperatives (Madhya Pradesh Women Poultry Producers Company Private Limited)—India's first completely backward- and forward-integrated producer company fully owned by rural women. The village-based cooperatives have more than 6,000 members. The majority of the members have no formal education and are classified by the Indian Government as living below the poverty line. However, since the establishment of the Madhya Pradesh Women Poultry Producers Company Private Limited in 2008, things have changed.
			• In 2017, the group collectively earned the equivalent of over EU\$2.5 million (US\$2.93 million).
			<ul> <li>5,000 women smallholder farmers have gained access to finance and chicken sheds.</li> </ul>
			<ul> <li>15 million chickens are produced by the Madhya Pradesh Women Poultry Producers Company Private Limited each year.</li> </ul>
			<ul> <li>Positive impacts on women's empowerment have included increased self-confidence, self-reliance, increased availability of protein-rich food for the community, and increased income for rural women.</li> </ul>
			Infographic available at: <u>https://www.rabobank.com/en/</u> images/infographic-mpwpcl.pdf

Cont.

Primary pathway of change	Sector	Initiative	Outcome
Access to and control over resources	Forestry	Working with women´s cooperatives to secure rights and restore degraded community forests	In 2014, The African Women's Network for the Community Management of Forests (REFACOF) worked with women from the Cooperative of Fisher People (COOPEL) in Londji village to restore degraded mangrove forest and plant orchards in coastal forest villages in Cameroon. As women's rights to plant trees were limited, REFACOF worked with community members, chiefs and husbands— who were the de-facto rights holders. The project invested in promoting leadership, and enhancing women's monitoring skills and access to specialized equipment. Equipped with new knowledge and resources, and with
			capacity in mangrove reforestation techniques, women have taken ownership of mangrove restoration in coastal communities in Cameroon. REFACOF has continued working with these women to secure legal status for the mangrove areas as 'community forests' and elaborate clear frameworks for their management (Mwangi and Evans 2018).
	Fisheries and aquaculture	Information and communication technology (ICT) including mobile video technology and banking apps for mobile phones (bKash)	<ul> <li>In coastal Bangladesh, recent fisheries management measures have closed hilsa shad (<i>Tenualosa ilisha</i>) fisheries for three months of the year, leaving those who are reliant on the fisheries for their livelihoods in a vulnerable position. Women, especially, are left with few options due to the unrecognized, informal and limited nature of their engagement with hilsa shad and with decision-making pertaining to the fishery. To strengthen women's economic resilience during the hilsa shad closure, WorldFish has introduced ICT to help women communicate, work, receive training in alternate means of labor (in this case, often crocheting toys and clothes for export) and receive payment without leaving the house, resulting in:</li> <li>Lessening the digital divide between men and women, thereby synergistically helping close the financial divide (Adam et al. 2021).</li> <li>Providing a workaround for gender-based mobility constraints (Choudhury and Tanzina 2020).</li> <li>Increasing capacities for women to engage in nonaquaculture income production (Choudhury and Tanzina 2020).</li> </ul>
	Livestock	Gender-responsive small livestock system intervention: direct livestock resource transfer (native pigs, with commercial feeds and climate-smart housing) (Rosimo et al. 2018)	<ul> <li>In Guinayangan, Philippines, the International Institute of Rural Reconstruction implemented a direct livestock resource-transfer intervention promoting the practice of low-external-input pig production.</li> <li>The intervention reached 192 households and served as a less-risk-prone livelihood opportunity, helping women farmers increase incomes and consequently control over where to spend it.</li> <li>In the first two years of the project there was a nearly 15-fold increase in the number of women farmers participating and benefiting (five to 74 farmers).</li> <li>Women were able to purchase school supplies and meet their children's other needs through the sale of livestock, and in some cases could afford medical treatments for their husbands.</li> </ul>

Primary pathway of change	Sector	Initiative	Outcome
Social norms	Forestry	ACM is a collective problem-solving and management approach that supports gender equity in negotiations and decision- making through participatory dialogues among community members and with other actors (Evans et al. 2014; Evans, Larson and Flores 2020).	<ul> <li>In Uganda, ACM led to shifts in norms hindering women's tree and land tenure, thereby allowing women to gain control over resources by securing their own plots and planting a greater diversity of tree species:</li> <li>51 women (out of 167) women planted <i>Ficus natalensis</i>, a tree denoting land ownership and forbidden to women, compared to zero women before ACM.</li> <li>Women, many of whom had never planted a tree before, planted 8,541 trees; before the intervention, there were 350 women-planted trees in total in the woodlots targeted for ACM (Mukasa et al. 2016).</li> <li>In Nepal, after eight years, changes resulting from ACM included:</li> <li>Enactment of several rules enhancing distributional equity (while conserving forest resources), including new permissions for income-generation activities amid the poor and women (McDougall and Banjade 2015).</li> </ul>
	Fisheries and aquaculture	GTAs, consisting of iterative cycles of intergender dialogues on gender norms, action planning and reflecting. In the study, GTAs included behavior-change communication, such as drama skits focusing on gender issues, combined with sessions to reflect on gender norms in participatory action research groups (Cole et al. 2018; 2020).	<ul> <li>In the Barotse Floodplain of Zambia, a quasi-experimental small-<i>n</i> (80) study of GTAs, used in conjunction with innovations in fish-processing technology to reduce postharvest losses, showed that GTAs catalyzed more significant changes in gender attitudes and in indicators of women's empowerment than gender-accommodative approaches (applied in control fish camps). GTA contributed to:</li> <li>Increase in gender attitudes scores from 11.7 percent (13.3 percent for participant men) across villages to 28.6 percent in GTA villages (35.7 percent for the men).</li> <li>Increase in women's participation in fishing from five to 75 percent after implementation of GTAs.</li> <li>49 percent increase in women providing 'large inputs' to intrahousehold decisions on how to spend income from fish sales.</li> <li>76 percent of men responded that they 'jointly' own fishing gear with their spouse, compared to 44 percent before the intervention (Cole et al. 2018).</li> <li>Gender-transformative interventions resulted in a mean increase in gender-equal attitude scores more than twice as high as when gender-accommodative approaches were used.</li> <li>The proportion of women who processed fish increased from 55 to 85 percent (Cole et al. 2020).</li> </ul>

Cont.

Primary pathway	Sector	Initiative	Outcome
of change			
Social norms	Livestock	Community conversations to transform gender relations and increase women's access to information on livestock in Ethiopia (Mulema et al. 2020)	Community conversations are a participatory action research approach meant to shift gender norms that limit women's meaningful engagement in productive roles and their economic empowerment. In Ethiopia, conversations bringing together community members and an array of stakeholders focused on the division of labor, access to and control of resources, power relations, and institutions and structures that influence women's empowerment and access to information on livestock health.
			<ul> <li>The program reached 1,600 men and women community members in five communities, with evidence of better safety practices when handling sick animals and increased awareness of the risks of antimicrobial resistance.</li> </ul>
			Program documentary: "Changing hearts and minds: Community conversations in Ethiopia" <u>https://www.youtube.com/</u> watch?v=goMy0UM6H0o&list=WL&index=1
Policies and governance	Forestry	Collective action through federations of user groups, and affirmative action (reservations) to promote the participation of women and marginalized groups in policymaking	<ul> <li>Watch Y egol (NYOUNGHOOD ISTENT Learned 25)</li> <li>Forests make up close to 45 percent of Nepal's total area, more than a quarter of which is managed by communities (RRI 2018). Since the national community forestry program was initiated in 1990, community forestry in Nepal has contributed significantly to community development and forest-cover restoration, rendering it a success story of forest conservation.</li> <li>Created in 1995, the Federation of Community Forest Users of Nepal (FECOFUN) was established as a coalition of forest users across the country, including Indigenous Peoples and women, to strengthen their voice in policymaking processes. It has since grown into the largest civil society organization in Nepal and a national social movement, comprising over 19,000 community forest-user groups and 8.5 million forest users; and emerged as a champion of women's leadership (Jhaveri 2020).</li> <li>To promote gender gender equality, FECOFUN's constitution states that:</li> <li>Half of its executive members at all levels (local, district and national) must be women.</li> <li>One of each of the key office-bearer positions of FECOFUN has to be occupied by women.</li> <li>FECOFUN's gender-equality rules were eventually adopted by the Community Forestry Guidelines issued under the 1993 Forest Act (RRI 2017).</li> <li>FECOFUN's success in reaching and engaging with communities across the country, including their women members, was demonstrated during the general elections of 2017, when 1,976 community forestry activists, 632 of whom are women, were elected to local government with FECOFUN's support (RRI 2018). Through their community forestry experience, these elected representatives gained confidence and vision (Jhaveri 2020). Their election in local government allows them to have a 'seat at the table' in key decision-</li> </ul>

Primary pathway of change	Sector	Initiative	Outcome
Policies and governance	Fisheries and aquaculture	Gender mainstreaming in national fisheries policies (United Republic of Tanzania 2015)	As Bradford and Katikiro (2019) explain, the Tanzanian National Fisheries Policy of 2015 (United Republic of Tanzania 2015) was the country's first national fisheries policy to attempt to mainstream gender into all levels of policy, planning, decision-making and implementation. Gender elements in the policy include:
			<ul> <li>Recognition of the negative effects of discriminatory sociocultural practices, lack of awareness and expertise, inequitable access to fisheries productive resources and benefits, and calls for the government to address these challenges.</li> </ul>
			<ul> <li>Calls for the ministry responsible for fisheries and aquaculture, local government, nongovernmental organizations and civil society organizations to support initiatives promoting gender equality.</li> </ul>
			<ul> <li>The policy seeks to mainstream cross-cutting issues, including gender and HIV/AIDS, in fisheries development.</li> </ul>
			Tanzania is also one of few countries to develop a national action plan to implement the United Nations' 2015 Voluntary Guidelines for Sustaining Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) (FAO 2015), which dedicates one of its 13 guiding principles to gender equality and equity (Bradford and Katikiro 2019).
	Livestock E t r 2	Empowering women through participatory rangeland management (ILRI 2021a)	The Piloting of Participatory Rangeland Management Project (PRMP) aims to support women's empowerment in pastoral societies via rangeland management institutions in Kenya and Tanzania. The project aims to do this by providing opportunities to value and use women's knowledge and their roles in rangeland management through an expansion of livelihood activities, improving their understanding of natural resource management challenges and potential solutions, and increasing participation in decision-making processes.
			<ul> <li>In Kenya, by the end of 2020, over 1,593 people directly participated in PRM activities, including 419 women (26.3 percent). Newly constituted committees are now working closely with youth, elders and women to manage grazing patterns and ensure grazing land is rested as needed.</li> </ul>
			<ul> <li>In Tanzania, 52 percent of officials in the rangeland management committees are women. This has given women more scope to voice their concerns and contribute to decisions about management and rangeland governance.</li> </ul>

# 6. The promise of closing the gender gap

Gender is scarcely discussed in foresight studies on food systems (Lentz 2021), and no foresight studies explicitly bringing gender together with forests, livestock, aquaculture or fisheries could be found. Yet juxtaposing findings from several studies suggests that enhancing gender equality in these sectors can have significant impacts across multiple food system outcomes.

In their systematic review of the impact of the gender composition of community-based **forestry** and fisheries resource-user groups on conservation outcomes, Leisher et al. (2016) find that women's participation in user groups correlates with a range of improvements in local natural resource governance and conservation (<u>annex table 1</u>). The participation of women, especially from poor and landless households, in the executive committees of forestuser groups in Nepal and India has improved ecological forest outcomes and distributional equity (Agarwal 2009, 2010). Considering that 96 percent of Nepal's forests, representing 1,664,918 ha, are community forests (Ministry of Forest and Soil Conservation 2012, cited in Poudel, Johnson and Mishra 2014) and that over 23 million ha of forestland are under community-based management in India alone (RECOFTC 2013), the potential **governance and conservation impacts** of achieving greater gender equality in participation in forest-user groups in these countries—and worldwide—are momentous.

Relatedly, the devolution of forest rights and governance to communities, when attention is given to the power and social relations that shape these governance structures, offers immense potential to strengthen gender equality and women's empowerment. In their literature review on women's land rights and poverty reduction, Meinzen-Dick et al. (2019) found strong evidence for a positive relationship between women's land and forest tenure and women's bargaining power and decision-making on consumption; and a high level of agreement, but less evidence, on the relationship between women's land rights and their empowerment (annex table 2). Tseng et al. (2021) found strong support for a positive relationship between women's tenure and empowerment, which correlates with additional positive outcomes in food systems (Quisumbing et al. 2023). Worldwide, between 2002 and 2017, forestland owned by or designated for communities increased from 10 to 15 percent, with most gains occurring in LMICs—this devolution of forest rights will continue globally (RRI 2018). Placing measures to increase equality at the heart of these processes can open unique opportunities for the **recognition** of rural women and forest dwellers as legitimate rights holders of forestland, which holds transformative potential for their **empowerment** at individual and community levels.

As noted above, postharvest **fish** losses have a gendered dimension tied to gender norms that dictate the nature and reach of women's participation in the fishing sector. Coupling gender-sensitive postharvest innovations with GTAs that help lift some of these normative constraints has supported a reduction in fish losses and favored social changes linked to women's empowerment (Cole et al. 2020, see table 1 at the end of section 5). Africa loses over a quarter of its fish harvest (Affognon et al. 2015), and projects a drop in per-capita fish consumption (FAO 2020a) linked to population growth (over half of global population growth by 2050 is expected in Africa (UNDESA 2017)). Given concerns about poverty reduction, gender equality and food security (Chan et al. 2019), reducing postharvest fish losses through bundled (social and technical) innovations can have significant impacts on gender equality and improve the **nutrition security** and **livelihoods** of millions of **socioeconomically marginalized people** in Africa and elsewhere (Kruijssen et al. 2021). Furthermore, fishing

communities are highly vulnerable to climate change as shifting weather patterns impact fish stocks and imperil coastal industries and homes (FAO 2022; Williams et al. 2019; IPCC 2021). Women's knowledge, priorities, perspectives and empowerment can contribute to building diverse, holistic adaptive approaches and **resilience** to climate and other kinds of shocks. In one example from Brazil, fisherwomen's empowerment in leadership was linked to reduced impact on fishing communities from the COVID-19 pandemic (Silva et al. 2022).

**Livestock development** can be a key strategy for reducing gender inequalities and bolstering household resilience, particularly under a changing climate (Acosta, Nicolli and Karfakis 2021; McKune et al. 2015). Animal-source foods (e.g., eggs, dairy and meat) are especially important for pregnant women, babies in their first 1,000 days of life and young children. Even slightly increasing the consumption of animal-sourced foods among vulnerable groups can substantially reduce malnutrition and childhood stunting. Small livestock (especially poultry), which are commonly managed by women, provide low-investment opportunities for **enhancing household nutrition** (especially through increased consumption of eggs) (Smith 2016). Closing gender gaps in the livestock sector will also increase **social welfare and educational outcomes** for women and girls given that women's livestock assets provide a regular source of income that can be used to pay for school or medical fees.

Some zoonoses are transmitted to humans through food, and women are more exposed to zoonotic diseases than men due to their customary food-preparation and animal-care roles (Mulema et al. 2020). Although women and girls are often tasked with the care of sick animals as an extension of their care work, women livestock keepers (especially from marginalized ethnic and low-caste groups) are often excluded from accessing livestock extension services and vaccines. Increasing women's access to livestock extension, including information on disease transmission and training in safe food-processing practices, can **reduce the burden of zoonotic diseases** (Serra et al. 2018), improve the **health of livestock**, and **decrease time required to manage livestock**, allowing women and girls to pursue other activities. In one example from Kenya, east coast fever vaccination in cattle translated to increased **school attendance** by girls while simultaneously increasing household income and **alleviating poverty** (Marsh et al. 2016).

# 7. Key policy messages and recommendations

Pathways to equality and empowerment are complex, context-specific and can be mutually reinforcing. Generating a deep and lasting change in gender equality will require multipronged strategies that advance change in tandem along the four pathways described.

The successful strategies described above substantiate that the following measures can be particularly transformative measures:

 Strengthening the agency of women and marginalized groups by supporting collective action and advocacy: This requires investing in inclusive resource-user groups (and subgroups), networks and multitiered associations able to advocate for the interests and rights of less powerful groups, and in equitable representation, leadership and influence in governance. A necessary step is recognizing the knowledge, labor and skills of all genders and of marginalized groups across the focal sectors, and these groups' legitimacy in related decision-making processes at all levels.

- 2. Equitably improving access to and control over resources and assets: For forest-dependent people, securing rights to land and forests is particularly transformative, and ensuring that women's rights are secured within collective rights is critical. So, too, is ensuring equitable access to and control over other collective resources, such as fish or pastures. To support the effective use, processing, management and trade of products from forests, fisheries, aquaculture and livestock, women's access to and control over private or collectively owned assets (such as means of transport, fishing and aquaculture equipment, and processing and storage technologies) must also be enhanced. Improving access to complementary services (Kosec et al. 2023)—such as extension and financial services—is needed for rural people in general, but particular investments are needed to close the gender gap in these services to allow women to develop their enterprises and access higher value markets. Measures are also needed to safeguard against the risks of poor women losing access to resources that become more valuable and sought by more powerful groups.
- 3. Promoting **normative shifts** to lift barriers to women's participation, voice and influence; access to and control over resources; and benefits across sectors: Behavior-change-communication and participatory and dialogic approaches that prompt critical reflection and action on norms can expand the range of acceptable livelihood options for women (and men) across sectors. These approaches must acknowledge the interdependence of women and men in livelihood systems, and engage with all gender (and marginalized) groups as change agents.
- 4. Creating, funding and implementing gender-responsive and gender-transformative policies, regulations and institutions: Societies need national-level forestry, fisheries, aquaculture, livestock and related (e.g., climate, biodiversity) policies, legal frameworks and institutions that address gender inequality and advance empowerment alongside other outcomes (dietary, economic and environmental) (Lecoutere et al. 2022). These policies must be coherent with national gender policies, and across sectors within and beyond agriculture. The growing number of public policies integrating gender considerations (see section 5.4), and those espoused by influential multilateral (e.g., World Bank and United Nations agencies), philanthropic or private institutions that shape the global policy context, must be accompanied by political will, adequate resourcing and institutional capacities to implement them.
- 5. Improving **data systems** to recognize and account for the contributions of women and socioeconomically marginalized groups across sectors: This paper has illuminated a significant lack of historic sex-disaggregated data to capture changes over time in gender roles, control over resources, benefits and decision-making in the sectors examined. Closing these significant data gaps calls for concerted investments, conceptual and definitional advances, and improved quantitative and qualitative methodologies. Data systems should account for unpaid and informal activities, norms, power relations, quality of participation, and gendered costs and benefits in these sectors. Finally, changes across the four pathways of change in gender equality elucidated above must be carefully and longitudinally monitored (Quisumbing et al. 2023).

Pursued together, these measures can help uproot systemic inequalities to release the immense potential that forestry, fisheries, aquaculture and livestock hold for enhancing and sustaining equality and empowerment globally.

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## ANNEX AND GLOSSARY

Available at: <u>https://hdl.handle.net/10568/129708</u>.



Generating Evidence and New Directions for Equitable Results (GENDER) is CGIAR's impact platform designed to put equality and inclusion at the forefront of global agricultural research for development. The Platform is transforming the way gender research is done, both within and beyond CGIAR, to kick-start a process of genuine change toward greater gender equality and better lives for smallholder farmers everywhere.

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