



Helping People and
the Planet Thrive



Gender Equality in Coral Reef Socio-ecological Systems

Literature Review

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Background

CARE's work in food and water systems seeks to contribute to realization of the rights to food, water and nutrition security of women small-scale producers and their families. CARE believes that approaches to building community resilience in any ecosystem should address the structural power and relational barriers which deny access to resources and opportunities for women. The relevance of this research and learning project to CARE is hugely significant as we seek to contribute to a major global program led by our strategic partner WWF. This program – the [Coral Reef Rescue Initiative](#) (CRRI) – is established to protect and regenerate the world's rapidly degrading tropical coral reefs for the benefit of people through nature-based solutions. The partnership comprises leading scientists and NGOs, working in collaboration with governments and communities to safeguard reefs, food security and nutrition, and livelihoods against climate change.

Purpose

The purpose of this project, which comprises literature review, technical and policy outputs, is to increase the levels of awareness and knowledge among CRRI partners and the wider development and conservation communities on the relevance and importance of gender-transformative approaches in interventions related to coral reef socio-ecological systems. A further purpose is to contribute to policy and practice discourse on equitable livelihoods and sustainable natural resource management in the context of relevant global processes¹ and to increase commitment to approaches that deliver positive gender equality and social inclusion outcomes. Finally, findings of this literature review will inform the development of a technical paper which will assess case studies and deliver good practice recommendations for all interested stakeholders.

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¹ Including but not limited to a) the UN Food Systems Summit, b) the UN Framework Convention on Climate Change, c) the UN Convention on Biodiversity, d) the Global Commission on Adaptation, e) the UN Sendai Framework for Disaster Risk Reduction, f) the UN Committee on World Food Security (particularly pertaining to emerging voluntary guidelines on Gender Equality and Women's Empowerment)

1. INTRODUCTION

Coral reefs are a major contributor to ocean biodiversity and provide ecosystem services to millions of people around the world (Hoegh-Guldberg et al. 2019). Yet, coral reefs are impacted by multiple and intensifying pressures from the impacts of land-based development, increasing extraction through fisheries, and climate change. Coral reefs around the world are likely to experience annual coral bleaching in the coming decades (Hughes et al. 2018). Climate change impacts, coupled with regional and local drivers—including over-fishing and pollution—have already transformed reefs, towards new species configurations and less coral cover (Bellwood et al. 2019). The world is at risk of losing between 70–90% of its tropical coral reefs by the end of the century (IPCC 2018).

Coral reef degradation is an impending crisis for the millions of people who depend on coral reefs for their livelihoods, food security and wellbeing (Teh et al. 2013). Reefs provide critical ecosystem services that support both income and subsistence, and are also often deeply connected to people's identities, lifestyle and social norms (Cinner 2014; Woodhead et al. 2019). Vulnerability to these changes is not uniform; coral reef dependent communities—and households and individuals within these communities—have different sensitivity, exposure, adaptive capacity and thus vulnerability to the impacts of climate change on coral reefs (Cinner et al. 2012a, 2018).

Navigating this ecological change will require responses at global, regional, national and local levels, including environmental management, biodiversity conservation, and approaches to bolstering livelihoods in coral reef nations and communities. Supporting equitable resilience in coral reef communities requires examining how coral reef ecosystem services are likely to change. It also implies countering the inequitable impacts these changes will have on people (Donner & Potere 2007; Darling & Côté 2018; Woodhead et al. 2019; D'agata et al. 2020), and ensuring that interventions are holistic and incorporate local governance systems and knowledge (Dutra et al. 2021).

All of these responses have the potential to reinforce, accommodate or transform gender equality. Thus, supporting women and men in coral reef nations and communities to experience improved wellbeing and resilience requires an inclusive (and at best, transformative) approach to all aspects of gender in coral reef socio-ecological systems.

i. Gender and coral reefs

Within coral reef-dependent communities, gender—in concert with other identities—shapes vulnerabilities (Call & Sellers 2019), access to coral reef resources (Lau et al. 2020), agency (Lawless et al. 2019) and opportunities to participate in and shape management (Rohe et al. 2018). Women and men tend to use tropical seascapes—including reefs—differently; in many places women glean for invertebrates in the intertidal zone and inshore reefs, while men fish for deeper water species (Weeratunge et al. 2010; de la Torre-Castro et al. 2017; Lau et al. 2020). Women also tend to be more involved in processing, selling and trading of fish, while fishing itself broadly tends to be considered men's work (Harper et al. 2013; Kleiber et al. 2014; de la Torre-Castro et al. 2017).

Yet, sex-disaggregated data (Harper et al. 2020), and gender research on livelihoods in coral reef dependent communities is nascent (de la Torre-Castro et al. 2017), which reflects research gaps in fisheries more broadly (Koralagama et al. 2017). Lack of attention to gender, failure to recognize and manage for gendered division of knowledge and labour, alongside unconscious bias, mean that women's contributions to livelihoods are

overlooked, under-resourced, and left invisible (Fröcklin et al. 2013; Koralagama et al. 2017; Harper et al. 2020).

Box 1: Gender and resilience definitions

GENDER: Is not about biological differences but a social construct that defines what it means to be a man or woman, boy or girl in a given society. It carries specific roles, status and expectations within households, communities and culture.

GENDER EQUALITY: The equal enjoyment by people of all genders and ages of rights, opportunities, resources and rewards.

GENDER INTEGRATED PROGRAMMING: Gender considerations must be integrated throughout all humanitarian and development programs and projects. This requires gender analysis at all stages: conception, proposal development, programme design, implementation and monitoring and evaluation.

GENDER SENSITIVE PRACTICES: Practices that recognise and respond to people's different gender-based needs and constraints.

GENDER TRANSFORMATIVE PRACTICES: Interventions that seek to target the structural causes as well as the symptoms of gender inequality leading to a lasting change in the power and choices women have over their own lives, rather than just a temporary increase in opportunities.

RESILIENCE: If the capacities and assets to deal with various shocks, stresses, uncertainty and change are built & supported, and if drivers of risk are reduced, and if these actions are supported by an enabling environment, then resilience is increased.

Source: CARE (2016) Gender Equality and Women's Voice Guidance Note. CARE International; and CARE (2016) Resilience Guidance Note. CARE International.

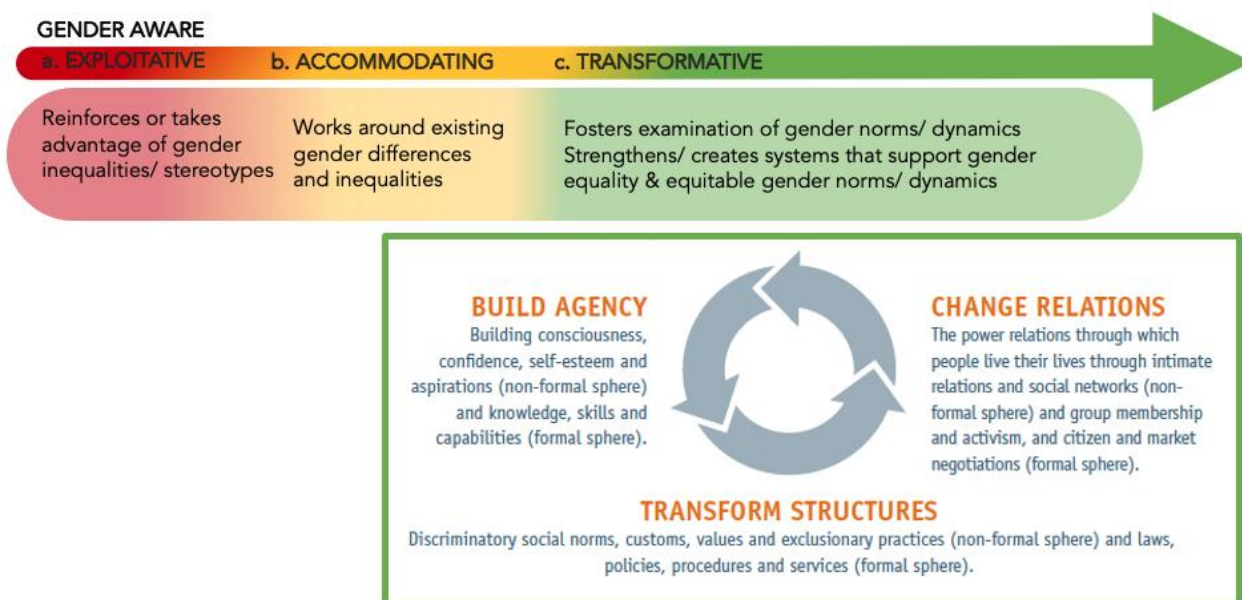
ii. Gender equality in climate change and livelihood programming

Given climate change vulnerability and impacts are gendered (Rao et al. 2020), all efforts to build climate change resilience, will have some bearing on gender equality and vice versa (see box 1 for definitions). For example, gender restrictive norms may limit people's ability to pursue climate change resilient livelihood strategies, and in turn, livelihood interventions could either support or undermine steps towards gender equality. As CARE notes: 'Neither gender equality nor resilience to climate change and disasters can be achieved without addressing how they impact on each other' (CARE (n.d.) Beyond Words, p.2). An informed understanding of gender dynamics and gender transformative strategies is thus critical to building inclusive and equitable resilience in the face of climate change.

As a first step, this review draws on CARE's Gender Equality Framework to examine literature on gender and gender equality in livelihoods linked to coral reef dependent communities. Gender approaches can range from exploitative—whereby gender inequalities are reinforced or used to advance project aims; accommodating—whereby projects work around but do not seek to change existing gender inequalities to; transformative (Figure 1). Transformative approaches ultimately aim at reaching gender equality, where 'men and women to have equal participation in decision-

making; the same access and control over productive resources, services and technologies; equal benefits from project results and the same opportunities to access decent employment and livelihood systems' (FAO & CARE 2019, p.2). To achieve gender equality, gender transformative approaches seek to promote gender-equitable power relationship between people and across communities, and to transform restrictive gender roles.

CARE's Gender Equality Framework takes a transformative approach (Figure 1). It encompasses three key domains for realizing gender equality; i) building agency to empower individuals to take steps to achieve their rights—informally through building self-esteem, consciousness, and aspirations, and formally through capacity, knowledge and skill building; ii) changing power relations—informally in intimate relationships and social networks, and formally through group membership, activism, citizenship and market relations, and iii) transforming structures such as land policies, procedures and services, and informal norms, customs, values and practices (CARE 2018). These three domains feedback into one another, and benefit from being pursued concurrently.



Adapted from 'Gender equality continuum tool. Interagency Gender Working Group, 2013 & CARE 2018

Figure 1. CARE's Gender Equality Framework (GEF) located on the gender equality continuum for approaches that are gender aware (in contrast to gender-blind). This figure is adapted from Gender equality continuum tool, Interagency Gender Working Group, 2013 & CARE 2019. Once programming has moved beyond gender-blind approaches (whereby gender is not even considered), gender aware approaches in livelihood and development programming range from a) exploitative, b) accommodating or c) transformative. CARE's GEF is transformative because it seeks to move beyond technical and surface level approaches to gender equality. The framework is being widely used in agricultural livelihood and climate change adaptation programming.

iii. Literature review scope

This literature review focuses on livelihoods, and gender in coral reef dependent communities in five countries; Fiji, Solomon Islands, Madagascar, the Philippines and Tanzania. The Coral Reef Rescue Initiative has identified these countries (and Cuba and Indonesia) as the location of important coral reef ecosystems, that have potential for enhanced resilience in the face of climate change. The livelihoods of people living in coral

reef-dependent communities can be influenced by interventions through four impact pathways (Figure 2), across the gamut of conservation to development programming. All four of these impact pathways may be done in isolation or combination. Each intervention type may require a different understanding of gender, different approaches to gender-sensitivities and may present different opportunities for a gender transformative approach – dependent on the initiative and the impact pathway and the desired (by women and by men) outcomes. These pathways include:

1 – Alternative or improved livelihood initiatives in coral reef dependent communities.

These interventions may be directly related to enhancing livelihoods connected to coral reefs (e.g., technology for cold storage in coral reef fisheries), or happening in coral reef communities but seeking to shift livelihoods to be less dependent on coral reefs (e.g., alternative livelihood projects).

2 – Initiatives that build adaptive capacity in coral reef dependent communities.

These interventions may focus on building adaptive capacity through enhancing assets (e.g., savings groups or microcredit) and agency, networks, learning, and address broader interrelated vulnerabilities (e.g., health), or connecting to strategies to cope with or adapt to risks and threats (e.g., strategies to cope with salt water intrusion).

3 – Conservation initiatives to conserve biodiversity of reefs.

These interventions seek to conserve coral reef resources, and may directly impact livelihood options women and men’s livelihoods (e.g., Marine Protected Areas).

4 – Resource management of marine/ land activities to ensure sustainability

Sustainable management of marine and land activities (e.g., fishing, farming) seeks to ensure the sustainability of livelihoods and of resources. The outcome of management decisions, as well as participation and power in decisions regarding management will impact livelihoods in gendered ways.

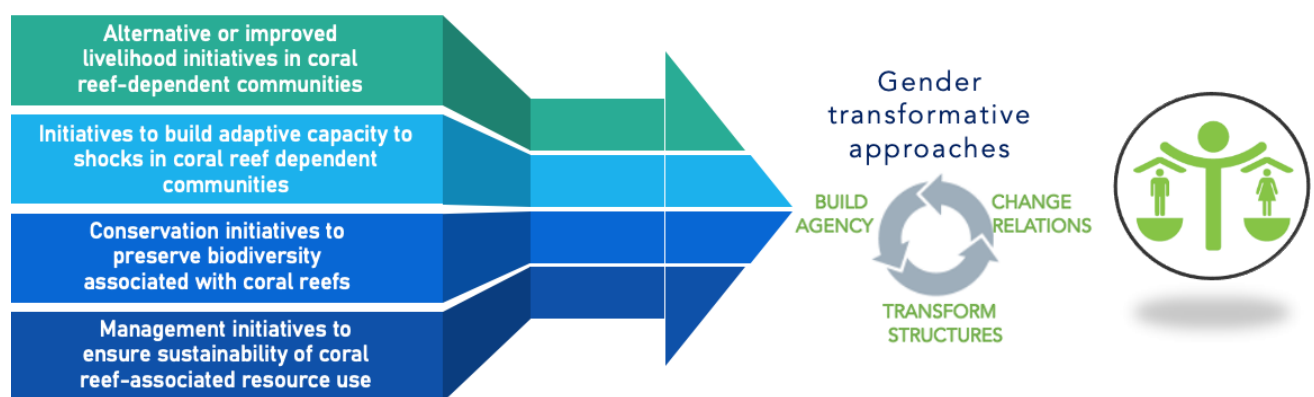


Figure 2. The four pathways through which the livelihoods of women and men living in coral reef dependent communities are influenced by external interventions.

This review examined peer-reviewed and grey literature across the gamut of these four impact pathways. Specifically, it aims to:

- i. Summarize knowledge about gender, resilience and livelihoods in coral reef dependent communities.
- ii. Summarize research on gender and livelihoods in coral-reef dependent communities in Tanzania, Fiji, Solomon Islands, the Philippines and Madagascar.

- iii. Establish the extent to which gender inclusive approaches have been successfully applied in Tanzania, Fiji, Solomon Islands, Philippines and Madagascar, and to what extent these initiatives have been transformative.

Rather than systematic, the review represents a synthesis of current literature. We drew predominantly on studies in peer-reviewed journals to understand the gender contexts in each country, and included grey literature (including reports, information bulletins) to provide an overview of key interventions. In the following sections, we outline key findings on gender, resilience and livelihoods in coral reef dependent communities broadly, charting progress and knowledge gaps on gender, before turning to an in-depth synthesis of gender context and gender interventions in each of the five focus countries.

2. GENDER AND RESILIENT CORAL REEF LIVELIHOODS

In coral reefs, social and gender norms shape adaptive capacity in key ways. Adaptive capacity refers to more than simply the assets (e.g., savings) to adapt, but also includes the flexibility (e.g., through livelihood diversification), organization, such as social capital (e.g. family or friend connections to draw on), learning (e.g. to anticipate change), and agency (e.g., the ability to freely make and act on decisions, including about livelihoods). For instance, restrictive gender norms curtail agency and shape capacity to adapt and innovate. For example, in the Solomon Islands, women and men perceived different agency in relation to decisions at community and household levels, and women were less likely than men to innovate and trial new livelihoods, because of perceived risk (Cohen et al. 2016; Lawless et al. 2019). In invertebrate fisheries in Tanzania, women had less access to high-value fishing grounds and markets, and had a lower income, which hindered them from accumulating assets (Fröcklin et al. 2013, 2014). In addition, several studies highlight how gendered ecological knowledge emerges from gender-differentiated spatial use of reefs and nearby habitats—in certain contexts women may have more knowledge of shallow, lagoon and mangrove habitats, and men of deeper water (Siar 2003; Fröcklin et al. 2013; Ferguson 2021). Ecological knowledge plays an important role in learning about and anticipating ecosystem change—a key aspect of adaptive capacity. As such, gendered differences in knowledge may mean that in certain context women and men will be differently placed to perceive and act on ecosystem changes.

While attention to gender and fisheries, and marine environments is growing (Harper et al. 2013, 2020; Gopal et al. 2014; Kleiber et al. 2014; Frangoudes & Gerrard 2018; Frangoudes et al. 2019), studies of gender are nascent in tropical seascapes (de la Torre-Castro et al. 2017; de la Torre-Castro 2019). Most studies of gender are connected to small-scale fisheries, and this is reflected in our findings in the following section.

We also found little evidence around what sorts of livelihood interventions result in more gender equality. A study in the Solomon Islands suggests that i) if livelihood initiatives provide compelling benefits to households, they can help women and men move beyond entrenched gender roles; ii) if initiatives are able to bear the cost and risk of innovation, then women may be more likely and able to experiment with new livelihoods, and iii) that agency and the sorts of adaptive strategies and participation in decisions that individuals have reason to value, may differ depending on gendered spheres of influence, e.g., the community versus the household (Lawless et al. 2015). More broadly, studies on the effectiveness of livelihood diversification on both gender equality and conservation outcomes also have mixed outcomes. For instance, studies suggest that coral reef livelihood diversification will not always have the desired effect of reducing fishing pressure (Cinner et al. 2012b). For instance, in the Philippines, seaweed farming was

introduced as an alternative livelihood activity to decrease destructive fishing. While widely taken up, it was mostly done by women and children, or men during times that they were not fishing, and thus the project did not impact the amount of fishing (Sievanen et al. 2005). In addition, livelihood diversification can result in increased time and labour burdens for women (Lawless et al. 2015).

Gender transformative approaches in fisheries

We found little literature on the practical application of or research into gender transformative approaches in relation to coral reefs. Two recent papers also outline a broader gap in understandings of how to implement gender transformative approaches in fisheries, and critically, in evidence on whether gender transformative approaches do alleviate gender constraints (Wong et al. 2019; Cole et al. 2020). An empirical study on inland fisheries in Barotse Floodplain, Western Province, Zambia provides the first comprehensive comparison of the outcomes of a gender accommodative versus a transformative approach in fisheries. The study found that when a gender transformative approach—a communication tool as part of an action research process to build critical consciousness—was applied, it led to an increase in gender equal attitudes, and an increase in women’s empowerment outcomes, compared to a gender accommodating approach (in the form of practical strategies to increase women’s participation) (Cole et al. 2020). These results highlight the benefits of using a gender transformative approach to engage with gender constraints, as part of projects connected to technical innovation.

3. CONTEXT AND GENDER APPROACHES IN FOCUS COUNTRIES

Overall, we found no examples of climate change resilient livelihoods projects that incorporated gender (e.g., projects seeking to build adaptive capacity), and thus most of the interventions in this section are from marine management, conservation, and development. Within these, we found a few examples of approaches that were more gender transformative or that addressed some of the aspects of the Gender Equality Framework (Table 1), but overall, most were gender accommodative.

Table 1: Examples of gender transformative approaches and example projects from across the four impact pathways.

Domain	Approach example	Project example	Pathway
Building Agency (capacities, skills, confidence)	Building skills and capabilities for women to participate in fisheries management	Oratsimba project, Madagascar. Trained women to become Marine Ambassadors who empowered women in their respective communities to be able to engage in fisheries management. Marine ambassadors provided training to women to increase skills, confidence, knowledge and ability to address men at community meetings (SEED 2014).	Building adaptive capacity Management initiative
	Building women collectives or networks	The Tanzanian Women Fish Workers Association (TAWFA) supports women’s networking in small-scale fisheries. TAWFA became a member of the African Women Fish Processors and Traders Network (AWFISHNET), a platform where women can share their voices and exchange information, in 2009 (Bradford & Katikiro 2019).	Building adaptive capacity Management initiative

	Promoting women as leaders	Blue Ventures: Fisher Women Leadership Programme (FWLP), Blue Ventures, Madagascar. Aims to increase women's participation in the management of coastal resources in local communities. Female community leaders or ambassadors train women to acquire skills and confidence to participate in management (Blue Ventures 2020)	Building adaptive capacity Conservation initiative Management initiative
Changing relations (e.g. household relationships and community groups)	Engaging women and men to discuss women's lack of participation	Tanga project, Tanzania. Men and women participated in meetings to discuss the lack of women participation. Participants identified restrictive customs and traditions. Women decided to participate in meetings and men promised to listen to women and enhance their participation. As a result, women had seats in the village committee and participated in creation of the management agreement (Van Ingen et al. 2002; WWF 2007; FAO 2017).	Management initiative Conservation initiative Building adaptive capacity Alternative or improved livelihoods
	Engaging community leaders in spaces where they reflect on power and decision-making	WorldFish, Community life competence process, Solomon Islands. Training with community leaders, focused on reflective processes. As a result, community leaders realized that it was important to engage all women, men, and youth of all communities affected by the design of a locally managed area, to promote people's respect for decisions, and promote a more inclusive participation (van der Ploeg et al. 2016).	Building adaptive capacity Management initiative
	Involving men and women in family planning activities	IPOPCORM project, the Philippines. Engaged men in decision and actions about family planning, empowering them to take joint responsibility (D'Agnes et al. 2005).	All
Transforming structures (such as agriculture and market institutions, land policies, social norms)	Women organizations advocate to increase legal recognition of women in fisheries policies	In the Philippines, women fish workers have organized at the community level, successfully advocating for fisher women's rights to be included in the Philippines Fisheries Code of Conduct and the Magna Carta for Women (Siles et al. 2019).	Building adaptive capacity
	Transforming markets institutions	Markets for Change project, Fiji and Solomon Islands. Aims to promote equitable participation of women and accountability in the governance and management of markets, ultimately aims to transform market institutions (UN Women 2014).	Alternative or improve livelihoods Building adaptive capacity

The Philippines

The Philippines has taken concerted steps towards gender equality. In 2021, it was ranked 17th out of 156 countries in the Global Gender Gap report (World Economic Forum 2021). At a national level, the Philippines has invested in “protecting, fulfilling, and promoting the rights of women in all sectors” through the Magna Carta of Women (2009). Across the Philippines, social and gender norms—including norms shaped by religious beliefs that position men as

breadwinners and title holders, discourage divorce and the use of contraceptives (Locke et al. 2017)—shape how women and men engage in small-scale fisheries. There is a gendered division of space and labour in fisheries and households. At home: household duties fall to women, while productive activities, including fishing fall to men. Women do go gleaning and nearshore fishing (e.g., reef fishing using scoop-nets, traps and fish baskets), and play a supporting role in preparing equipment, processing, and marketing men’s fishing catch (Siason 2000; Kleiber et al. 2014, 2018; Prieto-Carolino et al. 2016; Torell et al. 2021). In contrast, men fish from boats in subtidal habitats diving or using nets, hooks, and traps (Kleiber 2014).

At a management level, policies, decision-making and focus tend to centre around men’s fishing, and obscure the important role that women have in subsistence fishing and across the value chain (Siason 2000; D’Agnes et al. 2005; Prieto-Carolino et al. 2016; Yap et al. 2017; Kleiber et al. 2018; Siles et al. 2019). Further, “women are not brought up to be leaders and the culture dictates that they should play a supporting role” (Torell et al. 2021, page 249). As such, women face significant barriers to meaningful participation community and local institutions (Kleiber 2018), and are underrepresented (D’Agnes et al. 2005; Graziano et al. 2018; Kleiber et al. 2018). Benefits from markets, management, development and conservation projects are also often gender unequal (Prieto-Carolino et al. 2016; Kleiber et al. 2018; Torell et al. 2021). In general, women receive less economic benefits than men, because they tend to target and trade species with lower value (Torell et al. 2021), and have fewer social networks. The literature suggests that conservation initiatives, such as MPAs, tend to benefit men more than women—in part because they are implemented with men’s fishing as a focus (Eder 2005), but also that benefits may be different across genders, for instance women may benefit in different ways, for instance, from dive tourism (Clabots 2013; Kleiber et al. 2018).

There is evidence that over the past decade, gender roles have begun to shift, though not necessarily towards gender equality. Scholars suggest that livelihood pressures (reductions in fish stocks, increasing commodity prices) have led women to engage more in productive livelihood activities (Locke et al. 2017). There is also evidence that an increase in women’s access to information, resource and power, can cause a backlash and increase in domestic violence (Clabots 2013). In contrast, several studies have found that at a community level, recognition of women’s rights in fishing institutions and decision-making is growing (Kleiber et al. 2018). One study highlighted that local community members deemed women’s participation in institutions was important because their livelihoods are related to fisheries, and articulated that both women and men should benefit from management, and hold knowledge (Torell et al. 2021). In addition, other studies have shown that women are highly involved in communities, hold leadership positions (Dasig 2020) and are key to create and maintain Marine Protected Areas (Clabots 2013). These studies highlighted the importance of the social acceptability of shifting gender norms and roles to avoid negative feedbacks (e.g. domestic violence, increase women’s workload).

Interventions

We found a range of interventions that addressed gender across the four types of impact pathways on livelihoods, including in fisheries management and conservation (e.g., the regional fisheries livelihood programme (RFLV), and the Integrated Population and Coastal Resource Management (IPOP-CORM), and development (e.g., CTI Women Leaders Forum (WLF), microfinance project). Most projects focused on promoting equitable participation of women and men in implementation and decision-making processes, through increased

participation of women in management, empowering women (e.g., capacity building, economic empowerment, leadership) or benefiting women directly (e.g., microcredit).

Overall, the projects we found tended to be gender blind (not included here) or gender accommodating (Table 2). Although several projects focused on building agency, they did not do so in a way that sought to change broader relationships and structures, and so cannot be considered transformative. For instance, the RFLV project took an accommodating strategy, and focused on creating spaces for women to participate in the implementation and decision-making process and as fish wardens and fishery law enforcers, but did not consider how this would increase women's workload (Lentisco 2012; FAO 2017). The IPOPCORM project took a more gender transformative approach; it targeted both women and men for family planning activities, and sought to shift social norms. As a result, men became more responsible for issues that were traditionally considered women's responsibility (i.e., family size, birth spacing, reproductive health) (D'Agnes et al. 2005).

Table 2: Gender-related marine conservation, management, and development projects in The Philippines.

Project/intervention	Year	Description (gender issues)	Organization	Pathway
Regional fisheries livelihood program (RFLV)	2009-2013	Aims: 1) Reduce gender bias and inequalities; 2) Promote women and men's participation in project activities; 3) Create conditions for equitable access to project resources and benefits; 4) create conditions for equitable participation in implementation and decision-making. Focused on flexibility to allow women to participate. Used gender-sensitive indicators, sex-disaggregated data, gender impact assessment. Positive impact: integrated gender in Coastal and Fisheries Management Plans of local governments. Negative impact: increase women's workload as women have to do most of the domestic work (FAO 2017).	FAO, Government of Spain	Alternative or improved livelihoods Management initiative
Ecosystem improved for Sustainable Fisheries (ECOFISH)	2014	Women community organization members volunteered as guards of an MPA associated with ecotourism. Benefitted women by improving fisheries management and thus tourism. Strengthened women's economic empowerment in the tourism industry (i.e. provided skills to gain income from tourism) (Siles et al. 2019).	USAID, Government	All
Integrated Population and Coastal Resource Management (IPOPCORM)	2001-2008	Empowered women to make decisions about fertility, reproductive health, and environment. Increased participation of women in management. Targeted women for economic development component (i.e. loan to engage in fishing activities). Targeted both women and men for planning family activities (D'Agnes et al. 2005).	PATH Foundation	All

CTI Women Leaders Forum (WLF)	2017	Platform to build the capacity of the women from the Coral Triangle region to take leadership roles in sustaining the biodiversity and natural resources. Incorporated training and mentorship program to create a knowledge-sharing platform between senior women leaders and younger women with the goal of empowering a future generation of female conservation leaders. Developed a draft of a Gender Equality and social inclusion (GESI) policy to ensure gender equity in CTI-CFF (Coral Triangle Initiative 2021).	The Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security (CTI-CFF)	Conservation initiative Building adaptive capacity
Fisheries, Coastal Resources, and Livelihood (FishCORAL)	2016 - onwards	Integrated fisheries and coastal management project. Aimed to increase livelihoods incomes through livelihood diversification and sustainable management strategies. Included gender-responsive recruitment, gender-disaggregated baseline study, gender-sensitive participation, gender capacity building, pro-poor and women-friendly income diversification interventions, membership quotas for women in community-based institutions. Promoted political, economic, physical (improved health), and socio-cultural empowerment (i.e., recognition of women's work in fisheries and coastal clean-ups, recognition of women's management skills and knowledge) of women. Some evidence of shifts in men's attitudes towards women (e.g. men were more open to female membership in associations, men and women are saving earning) (United Nations Environmental Programme and Gender and Water Alliance 2019).	Bureau of Fisheries and Aquatic Resources, Fund for Agricultural Development	Alternative or improved livelihoods Management initiative Building adaptive capacity
Microfinance intervention	1990-1994	Women received microcredit to support fishery-related enterprises and improve their income. Improved women's status, increased income (invested in schools fees and business reinvestment), increased self-confidence, control over family decisions, and access to community governance spaces (Tietze & Villareal 2003).	FAO, United Nations Population Fund (UNDP)	Alternative or improved livelihood Building adaptive capacity

Fiji and the Solomon Islands²

At a national level, both Fiji and the Solomon Islands have taken steps towards integrating gender equality (Matthews et al. 2012; Weeratunge et al. 2012; Kruijssen et al. 2013; Solomon Islands Government 2016; Boso et al. 2018; The Pacific Community 2019). For example, Fiji has a national gender policy that sets targets for social justice and gender equity

² We choose to summarize the literature on gender in Fiji and the Solomon Islands together, to reflect commonalities and patterns in the literature. We note when we refer specifically to either country.

(Government of Fiji 2014). Gender is also increasingly integrated into small-scale fisheries policies in regional agencies, national governments, and NGOs across the Pacific (Harper & Kleiber 2019; Mangubhai & Lawless 2021). For example, the Pacific Handbook for gender equity and social inclusion in coastal fisheries and aquaculture (Barclay et al. 2021) aims to assist managers and practitioners to include gender in their approaches. However, both Fiji and the Solomon Islands face a lack of financial resources, technical capacity within national departments (e.g., at a ministry level in The Solomon Islands, Boso et al. 2018), accountability mechanisms, and support systems to promote gender equality (Lawless et al. 2021). At a local level, both the Solomon Islands and Fiji struggle to provide a safe environment for women, and equal access to economic opportunities (Yadao-Evans & Kauhiona 2019). Gender-based violence is a widespread and ongoing problem (Krushelnytska 2015; Ming et al. 2016).

Gender norms and roles shape women and men's participation and visibility in small-scale fisheries, in ways that hinder gender equality in Fiji and the Solomon Islands. Traditional gender roles still shape women and men's responsibilities, and constrain women's options. In Solomon Islands, *kastom* (or cultural belief systems) and gender norms and relations shape women and men to make claims over natural resources (Boso et al. 2018). Women tend to be responsible for household duties and childcare, and often engage in subsistence fisheries (i.e., reef gleaning, and nearshore fishing). Women are particularly active in post-harvest, processing and small-scale trade (Weeratunge et al. 2012; Kruijssen et al. 2013), and may subsidize their husband's fishing activities (Harper et al. 2013). Women make up 25% of fishers (Harper et al. 2020), harvest half of the total catch (Harper et al. 2013), and provide food security (Rabbitt et al. 2019). Yet, women's work is often unpaid, and considered an extension of household duties, and a lack of gender-disaggregated data and gender-sensitive policies also contribute to women's roles being undervalued and overlooked (Harper et al. 2013; Krushelnytska 2015). In conjunction, women have less access to assets (e.g., fishing gear, technology, education) (Thomas et al. 2021) and benefit less from fishing activities, markets, and management and development projects (Mangubhai et al. 2018). For instance, women received 47% less income than men in the cucumber fishery in Fiji (Purcell et al. 2018), receive less support from governments and NGOs (Mangubhai et al. 2018), have less access to information, and receive less training than men do (Thomas et al. 2021). In addition, markets structures and access may prohibit women's engagement because markets can be overcrowded, unsanitary and unsafe, and transport difficult to get (Krushelnytska 2015).

Women tend to have less power than men at the community level (Kruijssen et al. 2013; Lawless et al. 2019; Waqairatu-Waqainabete et al. 2019). Customary power relations that favour men (Paul et al. 2010), mobility constraints (e.g. due to domestic work), concern for reputation (because of traditional norms, beliefs, and practices), and lack of appropriate participation spaces for women (Dyer 2018) contribute to the marginalization of women in decision-making. For example, in Fiji, women are often unable to fully participate in community planning and management workshops because they are in charge of cooking and catering for the meetings (Matthews et al. 2012). At the household level, who makes decisions varies and may be in partnership, but men tend to have the final say in joint decisions and are often considered the head of the household (Cohen et al. 2016).

Literature suggests that gender roles are shifting across the Pacific (Cohen et al. 2016; Locke et al. 2017; Barclay et al. 2018; Lawless et al. 2019; Rabbitt et al. 2019). For instance, women are increasingly engaged in activities that were traditionally done by men. In Fiji, *i-Taukei* women engage in a wider range of fishing activities, target a wider range of species (fish, invertebrates, and seaweed), fish in a wider range of habitats compared to the past,

and some women use motorboats, challenging cultural restrictions (Thomas et al. 2021). Literature suggests that this shift may be a result of higher pressure on resources, a monetized economy, increase women’s access to education, changing aspirations, loss of social cohesion and custom, and a relaxation of social norms (Locke et al. 2017; Barclay et al. 2018; Lawless et al. 2019). Nonetheless, these shifts do not necessarily indicate greater gender equality. For instance, in the Solomon Islands, livelihood flexibility is increasing for women and men, but women also continue to undertake household duties (including childcare) alongside new pursuits—for instance taking children with them to markets combine income-generating activities with domestic responsibilities (Ram-Bidesi 2015)—increasing their workload and time demands (Cohen et al. 2016; Lawless et al. 2019).

Solomon Islands interventions

Gender interventions in the Solomon Islands have focused on building agency and empowering women (Table 3). WorldFish and The Nature Conservancy (TNC) developed training workshops for women to promote women's participation in conservation and development (Hilly et al. 2012; Schwarz et al. 2014). For instance, TNC, in partnership with the Mothers Union (i.e., Anglican women’s network) facilitated training workshops to promote women's participation in the Ridges to Reef conservation plan for Isabel Province. This increased women’s confidence to speak up about issues that affect them and their families and women’s empowerment in the conservation project (Schwarz et al. 2014). Other initiatives have sought to empower women through increased assets and skills. For instance, savings clubs have increased women’s self-efficacy, social and economic security, voice in household and community decision-making, and “greater prosperity for women and their families” and have been seen to play an important role in building adaptive capacity (Cohen et al. 2016; Yadao-Evans & Kauhiona 2019). In addition, women have developed conservation-related income-generating activities (e.g. in Tetepare communities) that have increased their income and community stewardship (Yadao-Evans & Kauhiona 2019). Furthermore, Solomon Islands is one of the countries with better gender-inclusive resource management. WorldFish has been promoting gender transformative approaches since 2011 (Barclay et al. 2015). For instance, WorldFish promoted a Research in Development Approach (RinD) which included a transformative approach to gender (Table 1) (van der Ploeg et al. 2016).

Table 3: Gender-related marine conservation, management, and development projects in Solomon Islands.

Project/Intervention	Year	Description	Organization	Pathway
CTI Women Leaders Forum (WLF)	2017	Platform to build the capacity of the women from the Coral Triangle region to take leadership roles in sustaining the biodiversity and natural resources (https://www.coraltriangleinitiative.org/wlf) [See table Philippines for more information].	The Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security (CTI-CFF)	Conservation initiative Building adaptive capacity
Training-of-trainers workshops	2008	Aimed to engage women and men in community-based resource management. A group of women in the Mothers Union in Kia were trained as community-based trainers who communicated messages regarding resource management to other women in the community. Multiple communities were	Mothers Union and WorldFish	Management initiative Building adaptive capacity

		benefited (Hilly et al. 2012; Schwarz et al. 2014).		
Ridges to Reef Planning Train the trainer's workshop	2012	Isabel Province. A group of participants obtained skills to raise awareness about the Ridges to Reef Planning. Men and women became facilitators and communicated the message across the Isabel Province. Outcome: many communities were interested in developing management plans in their areas, and TNC with Mothers Union began to assist communities in developing plans for protected areas (Schwarz et al. 2014).	Mothers Union and The Nature Conservancy (TNC), WorldFish	Conservation initiative Building adaptive capacity
Savings Clubs		Savings Clubs have existed for more than a decade in the Pacific (Pacific Handbook 2018). Aim: promote women's economic empowerment (e.g., providing opportunities to invest and save money, financial skills), leadership, and confidence, and standing (Pacific Handbook 2018). Savings clubs have also promoted income-generating activities associated with conservation, marine resource management awareness and have motivated other communities to engage in conservation (e.g. Mothers Union) (Yadao-Evans & Kauhiona 2019).		Building adaptive capacity Alternative or improved livelihood. Conservation initiative
Research in Development Approach (RinD)	2011-2015	Research approach. Community life competence process training with community leaders, which was focused on reflective processes. Results: community leaders realized that it was important to engage all women, men, and youth of all communities affected by the design of a locally managed area, to promote people's respect for decisions and promote more inclusive participation (van der Ploeg et al. 2016).	WorldFish	Building adaptive capacity Management initiative
Fish aggregating device (FADs)	2018	Economic development project. Alternative fishing area to reduce fishing pressure from the reef. Women and men were happy about the FADs (e.g. increased household income). However, women's participation in the project was low, exacerbated traditional gender roles, increased women's domestic work, women's community responsibilities (because men were absent). Changing power relations between men and women was difficult because gender roles were very powerful in the To'abaita society (men fish and women do the marketing and the gardening) (Labuinao 2019).	WorldFish, Ministry of Fisheries and Marine Resources	Management initiative Alternative or improved livelihood Building adaptive capacity
Markets for Change	2013	Project to make markets safer, inclusive, and non-discriminatory and promote gender equality and empowerment. Aim: increase women representation in marketplace governance, improve socio-economic security of women, promote gender-	UN Women, UNDP, Solomon Islands Government,	Alternative or improved livelihoods

		responsive, effective, and accountable local government and market management, improve physical infrastructures and operating systems (UN Women 2014).	Australian Government	Building adaptive capacity
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Fiji interventions

In Fiji, several interventions have had gender-related aims (Table 4). Most projects or approaches have focused on promoting women’s economic empowerment through the promotion of alternative livelihoods (e.g. pearl industry, coconut oil, honey and kuta mats), increased access to financial resources (through Saving’s clubs and microfinance projects), and increased access to markets (i.e. Markets for change). Some projects were associated directly with management or conservation. Conservation NGOs, including the Wildlife Conservation Society (WCS), and the World Wildlife Fund (WWF) promoted alternative livelihoods for women to reduce pressure on marine ecosystems, such as coral reefs or mangroves (Vunisea 2014; WCS 2014, 2015). Other projects engaged women to promote equitable gender representation in a community-based monitoring program, and promote compliance (Lalavanua et al. 2018). Most of the interventions focused on building agency (e.g. financial skills, creation of microenterprises, leadership, handicraft skills) and few promoted change in social norms or social relationships (e.g. Southgate et al. 2019; Waqairatu-Waqainabete et al. 2019). On the other hand, Markets for Change project aims to promote equitable representation of marketplace groups (including women) and accountable governance and management (UN Women 2014), which suggest that it has the potential to change relations (e.g. women have more power to influence decisions) and transform market structures. In addition, two transformative approaches aiming to change the attitudes and behaviors of men towards women have been reported in the literature (Mangubhai & Lawless 2021). One “promoted men to recognize the importance of women’s role as a resource steward and become champions for inclusion of women” in decision-making at the community level. The other project “worked with men to address gender-based violence in the Fijian capital of Suva.”

Table 4: Gender-related marine conservation, management, and development projects in Fiji.

Project/Intervention	Year	Description	Organization	Pathway
Women in fisheries network- Fiji (WiFN-Fiji)	2016	Aim: to facilitate networks, build partnerships, build capacity and provide training to women to promote their engagement in the fisheries sector. Involves women working in different fisheries sectors (Leweniqila 2017).	Women in fisheries network-Fiji (WiFN-Fiji)	Building adaptive capacity
Empowering women through Pearl-industry based livelihoods	2015?	Development of alternative livelihoods (pearl shell supply and handicraft). Women and youth groups were targeted. Project provided training for women and aimed to promote the creation of microenterprises. It is unknown how subsistence activities, gender norms will interact with this project (Southgate et al. 2019; Waqairatu-Waqainabete et al. 2019).		Alternative or improved livelihoods Building adaptive capacity
Markets for Change.	2013	Project to make markets safer, inclusive, and non-discriminatory and promote gender equality and empowerment. Aim:	UN Women, UNDP, Fiji Government,	Alternative or improved livelihoods

		increase women representation in marketplace governance, improve socio-economic security of women, promote gender-responsive, effective, and accountable local government and market management, improve physical infrastructures and operating systems (UN Women 2014).	the Australian government,	Building adaptive capacity
Microfinance project		Increase women's access to finance and promote women's economic empowerment. Literature suggests that these projects were not very successful due to a lack of capacity to write proposals, lack of knowledge on project implementation, monitoring, evaluation, and report (Vunisea 2014).	Government, city councils	Alternative or improved livelihoods Building adaptive capacity
Community-based monitoring program	2017	Aimed to monitor fish catches with an app in 24 communities in Fiji. Communities were encouraged to nominate female collectors, and 13 women and 11 men were selected. The inclusion of women increased the visibility of gleaning as a fishing activity. Women had access to training and resources (Barclay et al. 2021)	NA	Management initiative Building adaptive capacity
Fish Wardens	2018	Women were encouraged to apply to become fish wardens to revitalize the system to promote compliance with fisheries regulations (Lalavanua et al. 2018).		Management initiative Building adaptive capacity
Savings Clubs		Aims to promote women's economic empowerment (e.g. providing opportunities to invest and save money, financial skills), leadership) and improves women's confidence, capacity, and standing (Barclay et al. 2021). See Table 3 for further detail.		Alternative or improved livelihoods Building adaptive capacity
Supporting livelihoods and income generation	2013	Aims to diversify women's livelihoods alternatives, focused on producing and selling virgin coconut oil, honey, and Kuta mats. Aimed to empower women, increase their capacity (e.g., financial skills, production) and income, and benefit conservation (e.g. MPA) (WCS 2014, 2015).	WCS	Alternative or improved livelihoods Building adaptive capacity
Salt making, ecotourism and mangroves protection.	NA	Engaged women in salt-making and ecotourism as an alternative income generation venture. Salt making, protection of mangroves, and ecotourism mostly involved women (Vunisea 2014).	WWF	Alternative or improved livelihoods Conservation initiative
Overcoming markets access barriers	NA	In Namuimada in Ra, women collect <i>nama</i> (seagrapes) from the reef, to sell at Suva Market. Lack of access to transport and long-time travels limits their ability to access the market.	Locally-led initiative by women in the community	Alternative or improved livelihoods

		Women created an informal collective with bus drivers and local middle-sellers to overcome these barriers. The bus driver transported the seagrapes to the markets, and the middle-sellers collected them. Payments were compiled by the bus driver and delivered to women in the village (Barclay et al. 2021).		Building adaptive capacity
Empowering women through photovoice in the mud crab fishery	2016	The Women in Fisheries Network-led workshop using the photo-voice method. Women acquired skills and capacities to understand their role in the fisheries, understand the policies, and discuss in their communities. Helped women to realize the importance of men's and women's cooperation and became agents of change. Women provided recommendations for mud crab fishery management, created awareness campaigns, engage with authorities, implemented a mangrove reforestation program (Barclay et al. 2021).	Women in Fisheries Network	Management initiative Building adaptive capacity

Madagascar

In Madagascar, although the constitution (Article 6) and human rights legislation uphold gender equality, policies still tend to be gender blind (Fisheries and Aquaculture No. 053) or gender accommodating (National Policy of Women Promotion) (Murunga 2021). In small-scale fisheries, gender inequalities are underpinned by social norms and traditional gender roles, which limit women's political and economic influence and access to opportunities and resources. There is a gendered division of labour in productive and caring roles. Women are expected to have many children, have limited education opportunities, often marry older men, and are expected to take care of the family. Violence towards women is an ongoing problem (Singleton et al. 2019). Women combine household duties with intertidal gleaning and nearshore net fishing for subsistence—targeting octopus, sea cucumber, small fish, shrimp, and shells—while men fish offshore—targeting octopus, sea cucumber, sharks, pelagic fish, rays, shrimp, crabs, and turtles— and dive in the intertidal during high tide or bad weather (Barnes & Rawlinson 2009; Gough et al. 2009). This gendered division of space and fisheries means that women and men hold different ecological knowledge (Langley 2006). In addition, women are often involved selling fish.

There are gendered barriers to accessing opportunities and resources. Women have less access to education, resources (e.g., land, livestock), property rights, economic activities and income (Singleton et al. 2019) and have less mobility. Women also tend to have less access to commercially valuable fisheries and assets (Hill and Vigneri, Doss, 1999 in Westerman & Benbow 2013), with some exceptions. For instance, in Velondriake, a traditional subsistence octopus fishery became economically important, and this promoted men's engagement in the fishery, but women still hold a dominant and socially accepted role (Westerman & Benbow 2013), although there is some evidence that men may be displacing women (Harper et al. 2013).

Literature suggests that women have been more negatively impacted by conservation than men. For instance, MPAs have displaced women from their fishing areas, and women have been forced to stop fishing or to fish illegally at night (Baker-Médard 2017). In addition,

conservation organizations have focused on reducing local drivers of resource degradation instead of distal drives (e.g., market forces), and have affected women's fishing activities (reef gleaning) more than men's (Baker-Médard 2017).

Overall, women have limited political and economic influence at the community and household level (Westerman & Benbow 2013; Baker-Médard 2017). At the household level, women have limited financial independence and a lack of power in family planning (Rakotomalala & Tovondrainy 2017). At the community level, social norms restrict the ability of women to participate in decision-making (Baker-Médard 2017). In Velondriake, women's involvement in managing closures of the octopus fishery is low, even though it is financially more important to women compared with men (Westerman & Benbow 2013). The management system reflects gender power relations and reinforces gender inequalities; spaces for decision-making are not adapted to women's needs, they experience a lack of political voice and require their husband's support, lack time to participate, are under-represented (e.g. 16% of women in Velondriake association), and hold fewer leadership positions (Baker-Médard 2017; Singleton et al. 2019, Blue Ventures Institutional Information). Nonetheless, these barriers to participation are changing in some communities, such as Velondriake, where women and men recognize the need to increase women's participation in decision-making (Westerman & Benbow 2013).

Interventions

We found a range of interventions in Madagascar, and many combined several impact pathways, such as conservation and enhancing adaptive capacity. For instance, a family planning project was nested within an environmental livelihoods program and MPAs (i.e. LMMAs). In addition, an alternative livelihoods initiative (seaweed farming), which aimed to provide education, training and opportunities for women to establish businesses and participate in decision-making (i.e., increased agency was pursued concurrently with a management policy (octopus fishing closure). Finally, the Fisher Women Leadership Programme (FWLP), promoted women's participation in management, by building networks and agency. However, some literature suggests these projects may inadvertently reinforce gender inequalities because they do not take a transformative approach across all three domains (e.g., seek to build agency without changing structures) (Westerman & Benbow 2013; Singleton et al. 2019).

Table 5: Gender-related marine conservation, management, and development projects in Madagascar.

Project/Intervention	Years	Description	Organization	Pathway
Family planning services	Since 2007	Family planning services implemented alongside environmental livelihood programs in all LMMA and other sites in Madagascar (Harris et al. 2012). Benefits to women: more time to work, better mental and physical health, which contribute to their overall wellbeing and better economic security (Singleton et al. 2019). However, gender inequalities persist (e.g. women still earn less than men), and cultural and social norms still prevent women from participating in fisheries management (Singleton et al. 2019). Family planning services have provided benefits to women, but they have not built	Blue Ventures, USAID	Conservation initiative Management initiative Building adaptive capacity

		agency, changed relations, or transformed structures.		
Fisherwomen Leadership Programme (FWLP)		The initiative aimed to increase the participation of women in the management of coastal resources at a community level (Blue Ventures 2020).	Blue Ventures	Building adaptive capacity
Octopus fishery closure and seaweed farming		Aimed to establish a temporary octopus fishery closure (mostly targeted by women) while promoting an alternative income opportunity for women (seaweed farming). Result: women increased their ability to access markets (it became socially acceptable), to manage resources sustainably, to promote household wellbeing (e.g. nutrition, children's education), to control their own finances (e.g. able to invest), to engage with private companies, to learn business skills and to increase their participation in LMMA decision-making (voice and leadership) (Rakotomalala & Tovondrainy 2017).	WWF, with the collaboration of Blue Ventures	All
Oratsimba	2013	Lobster Fishery. Aim: train women to become marine ambassadors (build skills: communication, management, facilitation). Women train women in their respective communities, provide a platform where women can share their experiences with other women, build skills, confidence and knowledge to "address their male counterparts at fisheries meetings" and ultimately promote women participation (empower) in fisheries management (SEED 2020).	SEED	Building adaptive capacity Management initiative

Tanzania

Mainland Tanzania has moved toward policies that seek gender equality (e.g., National Strategy for Growth and Reduction of Poverty, National Strategy for Gender Development) (Murunga 2021). In 2015, the Tanzanian National Fishery Policy "acknowledge[d] the need for gender mainstreaming, the process of assessing the implications of policy or planned action to both men and women" (UN Women 2016 cited Bradford & Katikiro 2019, p.84). In addition, mainland Tanzania is one of few countries currently working to create a National Action Plan for implementing the SSF Guidelines, which include attention to gender equality (Bradford & Katikiro 2019). In Zanzibar, the Gender Policy "aims to protect women's rights, realize equality in opportunity and mainstream gender in national frameworks". In contrast, Zanzibar's fisheries policies (i.e., Zanzibar Fisheries Act and Zanzibar Draft Fisheries Policy) remain gender blind (Murunga 2021).

At a local level, cultural and social norms perpetuate gender inequalities in fishing communities. Social taboos limit women's access to fishing groups (e.g., women cannot be on or near water during menstruation or touch fishing traps during fabrication) (Shalli 2017; Bradford & Katikiro 2019). There is a gendered division of labour around productive and care work; women play an important role in the fishery sector, often collect invertebrates for household consumption and produce seaweed (e.g. Zanzibar) (Fröcklin et al. 2012; de la Torre-Castro et al. 2017). However, 'women are more valued by their reproductive work

than their productive work' (Bradford & Katikiro 2019, page 82), and the type of fishing that women do is not considered fishing (Porter et al. 2008).

Social norms around respectability limit women's access to certain industries such as tourism (Fröcklin et al. 2013). Access to certain markets is likewise limited. For example, there is a social norm that "respectable women" should not interact with men inside the main market (Fröcklin et al. 2013), and female fish traders tend not to trade with the tourism industry. In addition, there are constraints livelihood opportunities (e.g., diving with scuba gear on the reef (Lentisco & Lee 2015), assets, mobility, and thus fishing grounds. Lack of mobility has implications for women's adaptive capacity; they are less able to flexibly adapt to restrictions brought in by fisheries management (Fröcklin et al. 2013, 2014).

Finally, women are often excluded from formal fisheries management and tend not to be engaged in decision-making processes (Fröcklin et al. 2013). In addition, women's vulnerability to stressors on the intertidal zone where they fish (e.g. tourism, migration, coastal development) is not well understood (Lentisco & Lee 2015). There have also been cases where women have been displaced from fisheries as they become more profitable through connections to international markets (e.g., the octopus fishery, Porter et al. 2008).

Interventions

In Tanzania, we found projects across all four pathways that promoted gender equality, and these included several conservation and management projects at national and local scales. Tanzania created a National Task Team to implement and raise awareness about the SFF guidelines (FAO 2020), recognize and document women's role in small-scale fisheries, and led to the formation of the Tanzanian Women Fish workers Association (TAWFA)—a women's organization for networking and support activities in small-scale fisheries. TAWFA now serves as a platform for sharing women's voices and exchanging information (FAO 2020). The Ministry of Livestock and Fisheries Development also has a Gender Desk to aid in coordinating women's activities and act as a link between TAWFA and the government.

At a local scale, there are examples of projects that sought to improve livelihoods and enhance adaptive capacity. Specifically, projects have aimed to empower women through education, the provision of alternative livelihoods or livelihood enhancement (i.e. seaweed farming, shell-handicrafts), and through local women's organizations and networks (TAWFA) (i.e. building agency). For instance, the Zanzibar Seaweed Cluster Initiative (ZaSCI)/ SeaPower (Brugere 2019; Ramirez et al. 2020) introduced tubular nets to women seaweed farmers to improve productivity and local ecosystem conditions. The Tanga programme (IUCN) began from a recognition that 'unequal power relations between men and women and between different socio-economic groups [...] prevents equitable participation and access to resource' (Van Ingen et al. 2002), and as such, involved women and ensured there were adequate spaces and processes for their views to be heard (e.g., through women-only focus groups). The programme implemented participatory approaches, gender awareness-raising, and training at the government and community level and promoted equitable representation by men and women at all levels. The project explicitly aimed to shift gender power relations, through targeted discussions among women, and among women and men to diagnose and understand women's lack of participation, and as such, can be considered a transformative approach.

Table 6: Gender-related marine conservation, management, and development projects in Tanzania.

Project/Intervention	Years	Description	Organization	Pathway
Implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) in Mainland Tanzania (not in Zanzibar).	2017	Two main objectives: i) to develop a National Plan of Action (NPOA) to implement the SSF Guidelines (NPOA-SSF Guidelines); ii) to form a women's organization for networking in small-scale fisheries and related support activities. Created National Task Team to implement the SFF guidelines in Tanzania and aimed to understand women's role in SFF and create awareness of SFF guidelines within communities. TAWFA (Tanzanian Women Fish workers associations) in 2009 and was accepted in the AWFISHNET (African Women Fish Processors and Traders Network—platform where women's voices can be heard, and information exchanged). Project supported the implementation of the Gender Desk at the Ministry of Livestock and Fisheries Development, which coordinates women's activities and is a link between TAWFA and the government (FAO 2020).	Government, FAO	Management initiative Building adaptive capacity
Education project (WWF)	NA	Project that targets girls who have less access to a primary school than boys. For instance, in Mafia Island Marine Park, WWF provided scholarships to girls at both primary and secondary levels (WWF 2007).	WWF	Building adaptive capacity
Tanga Coastal Zone Conservation Development Programme (Tanga Programme).	1994	Project aimed to improve the ability of local communities to use coastal resources (e.g., coral reef fisheries) sustainably. Recognized different roles, responsibilities, priorities, and needs of men and women. Aimed to promote gender equity on resource access, participation in decision-making, and control over resources. Methods to improve gender equity: use participatory approaches in disaggregated groups, monitoring gender equity, making institutions responsible for gender equity, create role models, awareness-raising, and training, and encourage equitable participation at all levels (Van Ingen et al. 2002).	IUCN	All
Shell-handicraft project	2006	Introduced shell-handicraft as an alternative livelihood to low-paid seaweed farming and invertebrate harvesting activities and to promote sustainable management. Increased	USAID	Alternative or improved livelihoods

		women's access to physical, social (organization), and human resources (knowledge in marketing, leadership entrepreneurship) resources, increase self-confidence and decision-making power (Fröcklin et al. 2018).		Building adaptive capacity
Octopus fishery closure and seaweed farming		Seaweed farming was introduced as an alternative livelihood to octopus fishing in a village associated with Mafia Island Marine Park. Women received economic benefits (WWF 2007).	WWF	All

4. TOWARD GENDER EQUALITY IN CORAL REEF LIVELIHOODS

Overall, research examining gender in coral-reef dependent communities, and attention on gender and sex-disaggregated research is growing. However, key knowledge and practice gaps remain. Despite some work in the Pacific (i.e., Cohen et al. 2016), there appears to be little research on how restrictive gender norms inhibit certain groups from pursuing adaptive livelihoods in coral reef settings. Thus, while understanding the baseline gender norms and roles across tropical seascapes is an important gap to fill, connecting this understanding to studies of agency, adaptive capacity, and livelihood options, is an important next step. Further, there is a need to trial and evaluate gender transformative approaches in coral reef contexts. Across the five focus countries, we did find some examples of approaches that were gender transformative or that addressed some of the aspects of the Gender Equality Framework (Table 1), but overall, most were gender accommodative. In sum, better understanding of gender dynamics through place-specific studies, and trialling and assessing transformative approaches in coral reef settings will be key to address gaps between theory and practice (Wong et al. 2019; Cole et al. 2020).

Overall, research suggests that livelihood diversification has mixed success. Alongside further research on livelihood diversity in a given place, it is likely that a wider political economy lens will be necessary. Indeed, work in the Pacific has identified the need for participatory tools to diagnose the opportunities and challenges associated with potential new livelihoods or diversification strategies, including how they intersect with gender; 'livelihood diversification projects that are not attuned to community capacity, local contexts, aspirations and opportunities are unlikely to succeed' (Govan et al. 2019, p.2). Finally, a key practice gap for practitioners engaging in gender equality and livelihoods in coral-reef dependent communities, will be moving beyond targeting women, to also engaging men and boys. There appear to be few examples of interventions that engage men and boys. Broadening the focus group is a critical part of realizing gender transformative change. In addition, while several projects do address some elements of the GEF, rarely are interventions holistic enough to progress all three domains.

In sum, there are growing but disparate literatures, a number of practice gaps, and a number of opportunities to enhance resilience livelihoods and gender equality in coral-reef dependent communities. Specifically, future gender transformative livelihood approaches may seek to concurrently address gender equality in livelihood interventions directly, but also across management, conservation, and efforts to build adaptive capacity.

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