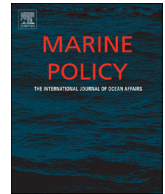




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Raising the voices of Pacific Island women to inform climate adaptation policies



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ABSTRACT

Policymakers and natural resource managers are increasingly recognizing the importance of broader geographic and gender participation in assessing climate vulnerability and developing effective adaptation policies. When such participation is limited, climate mitigation and adaptation policies may miss key opportunities to support vulnerable communities, and thus inadvertently reinforce the vulnerability of marginalized groups. This paper reports rich qualitative data from women leaders in conservation, development and climate adaptation projects to support local communities across seven Pacific Island nations. The results indicate the following priorities to support climate adaptation policies in the Pacific: (1) increased recognition for the importance of traditional knowledge; (2) greater support for local women's groups, including strategic planning and training to access climate finance mechanisms; and (3) climate policies that consider alternative metrics for women's empowerment and inclusion, formalize women's land rights, and provide land for climate refugees. Existing evidence is discussed which supports the importance of these priorities in the Pacific. Their input identifies research gaps in climate adaptation and provides important guidance for governments, non-governmental organizations, and development agencies leading climate adaptation efforts.

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1. Introduction

The Pacific Islands are on the front lines of climate change [33]. Often, they are characterized by perceived fragility, high vulnerability to climate change, and lack of adaptation options [53]. Such perspectives deny the agency of people at risk to define climate change in their own terms, to apply their own systems of knowledge, and to implement locally relevant solutions [7]. Specifically, the perspectives of Pacific Island women are not included in the extensive literature on climate change. Excluding the input of Pacific Island women results in less robust and equitable climate change programs and policies, and may miss the significant contributions of women. For example, women hold valuable traditional knowledge gained from their individual experiences adapting to environmental changes over generations [17]. Women also face equity and justice obstacles that prevent them from expressing, sharing, or applying their knowledge [16,24]. Therefore, gender is a key factor driving climate vulnerability and opportunities to respond (in addition to age, race, class, caste, indigeneity, and (dis)ability; [63]). Gender refers to the socially constructed roles and responsibilities of women and men. Specifically, it refers to “power relationships and the practices through which what is a ‘man’ or ‘woman’ get defined in different environmental contexts” [5]. Climate programs and policies, therefore, must consider and address such power relationships to support sustainable and resilient communities and ecosystems and to avoid exacerbating gender inequalities [48,56].

The lack of attention to the voices of Pacific Island women in climate research reflects a broader pattern of underrepresenting the importance of indigenous people,² gender, and traditional knowledge. Some researchers have criticized the Intergovernmental Panel on Climate Change (IPCC) for prioritizing western science and technological solutions [2] and for underrepresenting indigenous issues: “the coverage is general in scope, limited in length... and the historical and contextual complexities of indigenous experiences are largely overlooked” ([20], p. 349). Similarly, gender and traditional knowledge are rarely explored in detail in climate research (e.g., [10,43]). A recent United Nations Women report discussing the interface between gender equity, climate change and disasters in the Pacific failed to mention traditional knowledge [23], despite its critical importance in the region [19]. The lack of research applying a gendered lens is noteworthy because traditional knowledge is itself gendered (e.g., due to different social roles, ethnicities, age, access to ecosystems, and gendered divisions of labor; [17]). Thus, there is an urgent need to explore the intersections between indigenous peoples, traditional knowledge, and gender as it relates to climate vulnerability and adaptation.

To contextualize the discussion, the gendered impacts of climate from across the globe and the importance of traditional knowledge and indigenous participation in adaptation are highlighted.

1.1. Gendered impacts of climate change around the world

Climate projects have been criticized for adversely impacting marginalized people, by undermining tenure rights, disempowering local decision making, and limiting local livelihoods in the name of conservation and development [38]. Recent work in agrarian settings highlights how gendered patterns of labor and responsibility produce differentiated (i.e., different members of a population experience and/or respond to the impacts of the same event differently; or are exposed to different events; [6,63]). For example, research in the Arctic and India highlights how climate change impacts have disrupted traditional male roles which have led to problems of male identity and loss of men's self-esteem contributing to alcoholism and higher suicide rates in some communities [55]. Research in Mali demonstrates how women's

workload increased as livelihoods shifted from water to forest-based systems [18]. Climate-induced droughts in Ethiopia and South Asia have led to women and children having to walk farther to get firewood and water [58], losing time that could be spent on education, income generation, or putting them at risk of violence [69]. In Vanuatu in 2011, following two tropical cyclones, a 300% increase in new domestic violence cases was reported [14], and research in Samoa showed that people displaced by disaster were at higher risks of gender-based violence than people who stayed in their communities [34]. Similarly, Bradshaw and Fordham [11] discuss how disasters may affect women and girls by leading to increases in violence, loss or reduction in education opportunities, and an increase in their workload. Thus, differences in vulnerabilities to climate change can drive increased violence against some women and girls, reduced opportunities for education, and increasing workloads for women, important aspects that are also reflected in the women's experiences below in the Pacific.

1.2. Importance of traditional knowledge and indigenous participation in adaptation

Indigenous peoples have declared that traditional knowledge is necessary for their cultural survival [44]. Indeed, research has highlighted the importance of indigenous knowledge for understanding climate change and informing adaptation (in the Arctic – e.g., [10,3]; Africa – e.g., [51,52]; and the Asia-Pacific region – e.g., [59,40,43]). Traditional knowledge, regarding how communities have responded to past natural disasters (e.g., droughts), can provide important information to address current and future climate risks [51]. Further, traditional knowledge involves constant learning-by-doing, experimenting and knowledge-building, thus, can adapt to meet changing climate and environmental conditions [9].

Much of the research on traditional knowledge and climate change has focused on the value of local weather and environmental change observations to complement large-scale climate projections [27], and shifting from the colonial view of indigenous communities as “passive victims” of climate change to recognizing their active role in leading adaptation efforts [59]. Despite such progress, some indigenous people suggest that climate solutions proposed by governments and NGOs may threaten their indigenous rights [39,57]. Prevailing biases in environmental policies can marginalize traditional knowledge [19,44] and reinforce the preeminence of science and western views of development, which do not adequately account for different perceptions of what success looks like for different stakeholders in terms of sustainable development [4].

To address these research gaps and explore how these issues are playing out in the Pacific, results from a workshop in Palau in 2017 are presented. The workshop brought together women from Pacific island nations to discuss how they are being affected by and responding to climate change. The paper explores their role in climate adaptation activities, constraints to their adaptation, and their recommendations for developing adaptation policies and projects that better represent their diversity of voices, needs, and priorities, rooted in their cultural contexts. It addresses a key data gap noted in the Pacific [65,60] by providing rich qualitative data on climate change impacts and adaptation from Pacific Island women; and highlights the intersections between indigenous peoples, traditional knowledge, and gender as it relates to climate vulnerability and adaptation.

2. Methods

The Nature Conservancy conducted a workshop from March 29–31st, 2017 in Palau, bringing together nineteen women from seven Pacific Island nations (Marshall Islands, Palau, Yap, Kosrae, Chuuk, Pohnpei, and Papua New Guinea; Fig. 1). The Nature Conservancy is an international conservation NGO that has been working with local partners to lead conservation projects in the region for over 20 years.

² Many Pacific Islanders do not consider themselves indigenous, and while there is no universally accepted definition of ‘indigenous,’ a key criterion is self-identification [68].

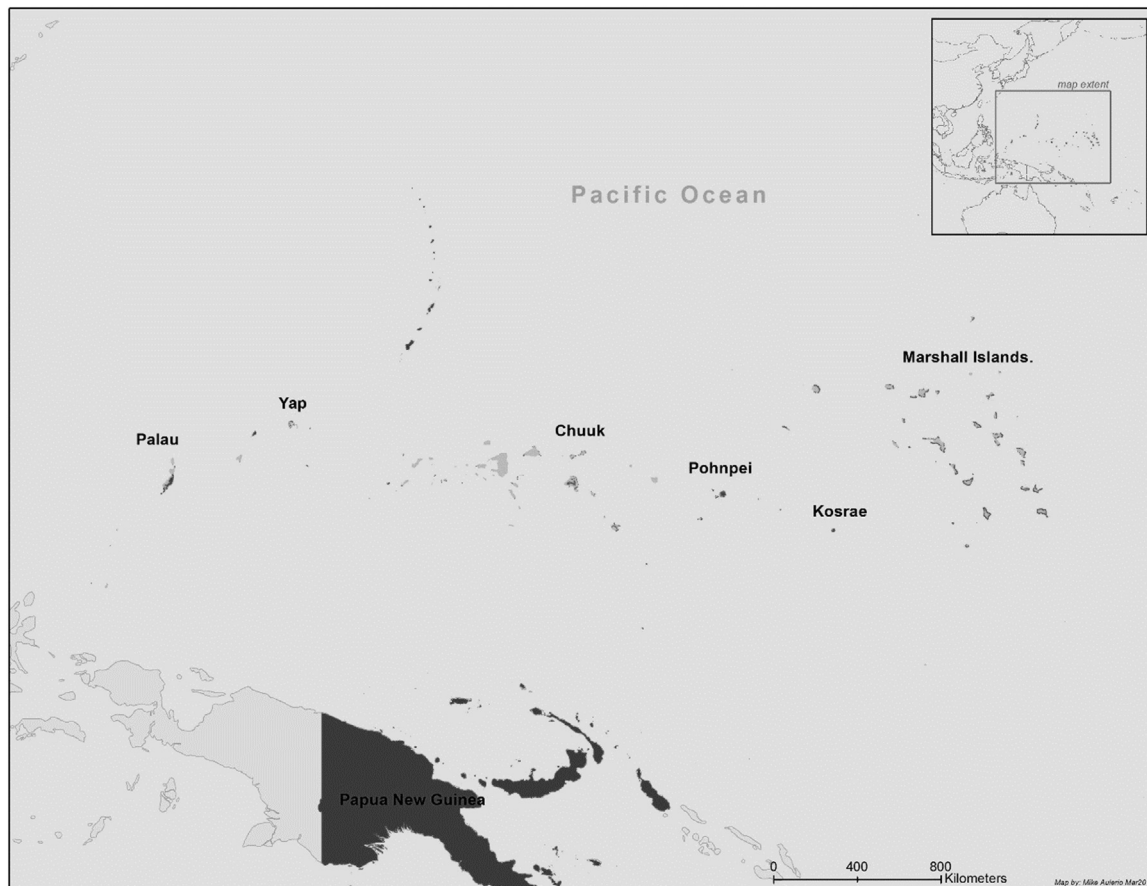


Fig. 1. Map of Pacific Island nations represented in the Women's Workshop in Palau, 2017.

Women were selected using non-probability sampling techniques, including purposive sampling and snowball sampling [29,64]. The Micronesia Conservation Trust and Nature Conservancy staff from Micronesia and Melanesia identified women who are leading conservation, development, and climate adaptation efforts in their communities. These local leaders were then asked to identify women in their communities based on selection criteria. Participants were selected to ensure geographic representation and differences in ethnicity (e.g., Marshallese, Palauan, Yapese, Kosraeans, Chuukese, Pohnpeians, Manus, etc.), socioeconomic status (landowners and non-land owners), education (ranging from no high school education to college graduates) and age (early 20s to mid-70s). Participants included subsistence farmers, participants of local women's groups, farming associations, and government, traditional and community leaders, and staff of local conservation and development NGOs, including those leading climate adaptation activities.

The workshop was conducted in English, but local translations were provided by native speakers for all represented islands. The workshop participants broke into small groups (4–5 people) and were asked to identify key challenges posed by climate change. These were grouped into broad categories (food security, water security, coastal protection, and human migration) and breakout groups discussed examples of how they are addressing these issues locally. The workshop content was recorded and transcribed by local staff from each island. Video interviews were conducted in Palau with all participants in English or local languages and then translated into English by native speakers. The interviews were semi-structured. Participants were asked how they are being affected by climate change and how they are responding to these impacts. The video footage was requested by the participants prior to the workshop to share the results with their communities. Before participating in interviews, written consent was obtained from all

participants, and they were informed how the video footage would be utilized. Copies of all interviews and videos were shared with all participants following the workshop. Thirteen of the authors participated in the workshop and ten are from the Pacific Islands.

3. Results

3.1. Gendered impacts of climate change in the Pacific

Many of the gendered impacts of climate change noted above (e.g., increased violence against women and girls, reduced access to education, increasing workloads for women) were shared in the Palau Workshop. Women mentioned that in Chuuk and in the Marshalls, violence was reported by some women and girls as a result of droughts. In the Marshalls, the head of local women's group stated that during drought "when they don't have enough water, the woman is not able to cook the food, or do the laundry, or prepare the husbands clothes, and she can end up experiencing violence from her partner." She also mentioned that during droughts, the schools often close because there is no water to prepare the food or to flush the toilets, thus increasing climate change impacts on children. The President of the Chuuk Women's Council shared that during droughts in Chuuk, young girls, who must walk farther to water wells, can become victims of assault.

Women from the Marshalls and Papua New Guinea mentioned that while many Pacific countries have policies to eliminate domestic violence, gender departments are often under-resourced and have limited capacity, thus they highlighted the need to raise the profile of these issues in climate change discourse to ensure they are enforced. Four of the women who work with the national governments in Papua New Guinea, Palau, and Pohnpei discussed the need for an analysis of existing climate and gender policies from local to global levels to

determine where they can be harmonized (e.g., integrating climate considerations into the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW); integrating gender equity into national adaptation plans). They also mentioned the need for stronger collaboration between local women's groups, national gender development offices, and CEDAW (although not all Pacific countries are signatories to CEDAW).

Women also discussed how climate change is affecting their workload. A woman from Papua New Guinea stated that “because of climate change, the work that we do has doubled because there is scarcity in our production, we don't produce high yields, reduced soil fertility and erosion.” Others highlighted the importance of increasing education opportunities for youth to better prepare them for climate change. A member of a woman's group in the Marshall Islands, said, “I want my daughter to finish school so she can increase her knowledge...And I want her to know what to prepare for, for her and her family in the coming days.”

The Director of the Migrant Resource Center in Pohnpei mentioned that projects designed to reduce climate risk by replanting and protecting coastal mangroves to reduce flooding were adversely affecting migrants who depend on cutting the mangrove wood for their livelihoods. She also highlighted the displacement of people due to climate change:

“There are a lot of people being displaced and relocated because of climate change and it is not their choice. Their islands are sinking, their food is scarce and they are being relocated... They become vulnerable because this is not their birth place, they don't know the culture, they don't own the land.”

A subsistence farmer from Papua New Guinea highlighted the problem of landownership and reduced food security. She stated that she does not own land in her community because her grandfather came from another province:

“Landowners will not allow us to make gardens on the land or even fish in the sea. And with climate change, with coastal erosion we want to move inland but we are not allowed to move inland. The government has given us a piece of land, and the only food we have is sago and tapioca...But as we use the same soil again and again, the soil is no longer fertile.”

Another participant from Papua New Guinea recommended that the government set aside a percent of public land and ensure support for climate refugees to help them resettle and integrate into their new community. Three women from Papua New Guinea also highlighted the need for governments to develop policies that provide land to women (e.g., to plant gardens and farms to support their community). They said that in some Pacific Islands, women are not entitled to land rights due to customary laws and practices; thus, policies that address land ownership inequity are needed as climate change is reducing the available land.

3.2. Importance of traditional knowledge, practices, and leadership

Workshop participants highlighted the importance of supporting traditional practices to cope with increases in erosion, drought, flooding, and changes in crop yields due to climate change in the Pacific. The Secretary from Palau Resource Institute stated that

“Traditional ways are returning because of climate change... Palau's way of dealing with the issue of climate change has helped us... we go back to nature and culture to figure out how we deal with the situation...what my Grandmother used to do when there was not much rain was she would tell us, just cut the grass and leave them where they are, they need to cover the ground [to keep it moist].”

A woman from Yap shared “climate change is not something new to us, it's always been there and we have ways to fight climate change, like

with sea-level rise, there are traditional techniques that we could use.” In the Marshalls, such techniques include planting local trees traditionally used to prevent coastal erosion (e.g., mangroves, Pandanus). In Kosrae and Chuuk, women are relying on traditional practices for managing drought including drying and fermenting breadfruit to support food security. Increased heat stress on plants is leading to women revitalizing traditional gardening practices, such as in Kosrae, laying palm leaves over the soil to keep it cool, and in Yap, covering young taro plants, transferring young shoots to shady areas, and mulching around taro patches. During droughts in Pohnpei, women's knowledge of the location of traditional wells enabled them to find potable water and build new shallow wells. A Chuukese woman said, “only older women know where the traditional wells are located,” highlighting their important contribution to climate adaptation.

Workshop participants also reinforced the importance of women's roles in maintaining traditional knowledge (e.g., “we are keepers and nurturers of knowledge”) and expressed fears about traditional knowledge being lost. A woman from Papua New Guinea said,

“there is a danger of it being lost [we need to] bring people together to learn how to hold on to their cultures, to their traditions, and then we can go back and teach our younger generations.”

Others shared that women joining the workforce is resulting in a loss of traditional knowledge (e.g., in Palau, many women now work and are no longer cultivating their taro patches and are losing knowledge of how to plant and cultivate taro). A Marshallese woman noted that they are trying to retain traditional knowledge and practices to cope with climate change,

“the Marshallese, like other Pacific islands, have traditionally been an oral tradition culture...we have to make sure we're documenting this knowledge and sharing and passing it on to the next generation...one of the objectives of my organization [local women's group] is to preserve our traditional knowledge and skills to save our environment.”

Women noted that the changing climate has affected the timing of when they traditionally plant crops. A woman leading a women's farming association in Kosrae said that climate change impacts including droughts and flooding have forced them to plant at different times. A Palauan woman shared,

“We used to know when to plant, the season... but now we don't know the weather... It's all changing... usually we plant in August, it's like a big planting season... but now, people just don't know... we don't have the information to inform our people...So I think if we have the right information... if we knew El Niño was coming, was coming for six months long... we could prepare the women a lot better.”

Such statements highlight the limitations of implementing traditional techniques in the face of climate change, and also the need for a combination of both traditional and scientific knowledge of climate change impacts and natural climate patterns such as El Niño and La Niña.

Another key finding was the relationship between political representation and traditional leadership and the implications of different metrics for empowerment. For example, one woman from Pohnpei shared that women have a lot to contribute to policymaking, but must seek the blessings of their traditional leaders. A woman from a conservation organization in Pohnpei warned that western metrics for empowerment can devalue the roles women play in their cultural setting,

“There is a lot of western imposition in the international space and you can actually devalue the roles women have played in their cultural settings when they did have a lot of power. We would like to see policies revived or written that recognize traditional women

leadership roles...the minute you say, for example, 4 women must occupy seats of Congress, you automatically say their traditional leadership roles are no longer valued because Congress is the one that trumps all of it.”

The women also discussed how women in the Pacific can be very influential through their traditional roles, and while significant, their influence may be behind the scenes. A woman working for a development NGO in Pohnpei said,

“I believe in the equal opportunities and equal rights, freedom of speech ... however maintaining the custom, the culture, and the respect that each person has in his or her own culture and country.”

A young woman from Yap said, “we don't have to get into high positions to have the public hear our voice, but it's us being in action that really counts.” A woman from Palau said,

“when it's your culture and when it's your traditions, you know what to do... but when you try to assimilate someone's culture and their ways, it's difficult because your people may not accept that. So I think it's better that we stick with our own culture, try to enhance and strengthen the roles of the women.”

Such statements highlight the importance of traditions and valuing traditional forms of leadership, in addition to recognizing the diversity of perspectives surrounding women's empowerment and engagement in decision-making.

Finally, two participants from Papua New Guinea noted that increasing population pressure needs to be addressed in parallel with climate projects and policies because increasing populations can lead to land shortages that result in increased food and water insecurity. The Director of the Nature Conservancy's Papua New Guinea program highlighted the importance of family planning and mentioned that women from Bougainville, Papua New Guinea, reported that while they wanted to implement family planning programs, often their husbands were not supportive. She stated that,

“Climate change policies must integrate population policies if we want to see our women rise out of the hardships brought on by climate change... We must mobilize and raise awareness of the need for a population policy and for the urgent need for our menfolk to understand the importance of planned and improved families.”

3.3. Women-led adaptation efforts

The workshop participants discussed how they are leading adaptation activities to reduce their vulnerability to climate change, and their responses demonstrate the diversity of strategies employed by women in these island communities. For example, women in Palau, in partnership with the Palau Community College Cooperative Research and Extension, are experimenting with salt-tolerant varieties of taro (a traditional food crop) in response to coastal flooding and saltwater intrusion, and are moving taro patches inland to less vulnerable areas. A woman leading a climate-focused taro restoration project in Palau shared how such projects can provide cultural benefits as well.

“In the taro patch we transfer the skills, also the way of life for women in Palau... one of the roles of women in Palau should be to try and provide a training to teach the young women how taro culture is so important, that it's not only a food on the table or that its healthy, but it's also a way to connect with your daughters, to teach them the way of life in Palau.”

In Yap, women are planting palms in flooded taro patches to provide material for weaving and home building, and also for protection from coastal flooding. They are also developing a nursery of native plants to provide seeds for food and medicine and to help repopulate areas damaged by flooding. A woman working for a conservation organization

in Papua New Guinea shared that

“for us women, we are trying new ways to grow crops, so instead of just having gardens, we are growing crops like taro and cassava and yams in recycled rice bags.”

They shared that planting vegetables in plastic bags and raised beds helps to prevent saltwater intrusion and provides planting space where fertile land is limited. To harvest rainwater during drought, women in the Marshalls are braiding Pandanus leaves to guide rainwater into storage containers. They are also planting native plants along the shorelines to reduce coastal erosion and flooding.

What is evident from the numerous examples above is that women across the Pacific are playing an active role in adaptation to help their communities cope with the impacts of climate change. A key lesson is that while traditional practices need to be supported, women are testing innovative strategies building on their traditions, and keeping them alive by modifying them to adapt to current climate conditions. Women mentioned the need for replicable, local-scale projects that can be implemented at the community level; “We women have the responsibility to ensure there's food on the table... we need techniques that are easy to use.” Participants also recommended that climate projects led by NGOs and development organizations should build on existing adaptation projects led by local women.

3.4. Greater support for local women's groups

Workshop participants mentioned the need for greater collaboration with, and support for, local women's groups (e.g., Chuuk Women's Council, Women United Together Marshall Islands; WUTMI) in adaptation projects. They mentioned that women's groups in the Pacific are already engaged in climate adaptation efforts, and suggested that NGOs need to provide training for women's groups to help them to develop strategic action plans, establish bylaws and mission, and conduct board training. Women also mentioned the need for increased access to climate funding, such as the Green Climate Fund, and support to meet the funding requirements of climate grants (e.g., requirements for a gender policy and gender action plan). This need was echoed more broadly by Pacific Island Leaders who declared that “there is a need for donors and international organizations to greatly simplify criteria and processes for accessing climate change financing, which is particularly disadvantageous to small states” [36].

Participation in women's groups can allow women the opportunity to speak freely in an all-female setting. A woman from a Yap community-based organization shared, “I'm still young ... This is the first time that I've been at a meeting that is only women. I feel I can be open with everyone because it's all women in the room.” Another woman from Yap shared that in village meetings, the younger generation may not be free to speak unless called on by the elders:

“in settings like this, where you bring women from across the region... it provides a different atmosphere where we encourage the women regardless of where you came from and what age you are that you can speak and share your perspective. That would be something that would be difficult if you were to do it inside your own community.”

The Director of a woman's group in the Marshall's said that she has been to several women's workshops in the South Pacific on climate change and she noticed that:

“Micronesians tend to be silent when we go to those spaces... we're naturally quiet. There might be some intimidation to speak out in workshops in other Pacific Islands, so I definitely would like to see more of this with Micronesian women because I think there's a lot that we can learn from each other.”

These statements highlight the critical need for opportunities for women to come together and share their voices, knowledge, and

experiences, and they highlight how age can affect opportunities to contribute their views.

4. Discussion

4.1. Gender integration into international climate policies and financing

The call to harmonize climate and gender policies noted in the Palau workshop is not new (e.g., [49,28,2,35]). Indeed, a recent report reinforced the need to integrate national gender mechanisms and women's departments into governmental institutions addressing climate change (e.g., through appointing gender focal points in relevant ministries and governmental bodies; development of a gender and climate change mainstreaming strategy or action plan to guide governmental action; integrating gender equality into policy mechanisms through gender budgeting) [66].

Over the last two decades, gender has been increasingly recognized as a key consideration in climate policies and programs. In 2001, the United Nations Framework Convention on Climate Change (UNFCCC) mandated that national adaptation programs should be guided by gender equity. The Hyogo Framework for Action 2005–2015, followed by the Sendai Framework for Disaster Risk Reduction 2015–2030, explicitly mention the need for gender perspectives to be integrated into all Disaster Risk Management policies, plans and decision-making processes. In 2014, the UNFCCC called for an action plan to develop a program on gender (Lima Work Programme on Gender). Based on this, the Paris Agreement formally recognized the linkage between climate change and gender equity including the rights of women, indigenous peoples, local communities, among others in vulnerable situations, and required the inclusion of gender-responsive adaptation actions.

Although reference to gender increasingly appears in these policy frameworks, a significant gap remains regarding the implementation of these policies [46]. For example, a review of the Hyogo Framework for Action (2005–2015) showed a complete absence of gender disaggregated data in most Pacific countries [65]. A subsequent review revealed slow progress by Pacific Island Countries in improvements to social inclusion and gender issues in practice [45]. Many reports submitted by Pacific Island nations to the UNFCCC mention gender, but they rarely discuss opportunities for enhancing women's leadership in adaptation planning, or their access to resources, such as land, finances and technologies, [46]. These opportunities are necessary for gender equality, women's empowerment and resilience to climate change. These opportunities were also acknowledged as priorities by participants from Pohnpei, Palau, and Papua New Guinea in the Palau workshop.

Financial mechanisms under the UNFCCC (i.e., Green Climate Fund (GCF), the Global Environment Facility (GEF), and the Adaptation Fund) have gender policies and action plans that seek to mainstream gender across implementing and partner organizations. Such efforts have led to increased integration of gender into climate projects (e.g., following the GEF's adoption of a gender policy in 2011, the proportion of gender-responsive projects more than doubled; [23]). However, a 2017 review of climate-focused GEF projects globally showed that only 22% were rated as gender mainstreamed (i.e., the project did not assess the implications of project activities for women and men and “gender perspectives and attention to the goal of gender equality” were not central to project activities) [22]. A recent review of GCF's Gender Policy and Action Plan highlighted the need for the policy to move from a “gender-sensitive approach” to a “gender-responsive” approach (i.e., moving from mindfulness of gender differences and ‘doing no harm’ to gender-responsive climate actions that address gender gaps and help to overcome historical gender biases; [32]). Additionally, researchers note a lack of gender-sensitive climate funding; less than .01% of global grants support projects that address both climate change and women's rights [21,67], despite research suggesting that financial policies with gender equity objectives can contribute to improved economic

outcomes and higher social benefits [62].

4.2. Women leading adaptation building on traditional knowledge

Recent research emphasizes the capacity of women globally to design new technologies and adapt existing ones to meet their needs [31] and in the Pacific [1]. The workshop results reinforce this finding and demonstrate how women are leading a diversity of adaptation activities in the Pacific that incorporate innovative techniques and build on traditional knowledge. The implementation of local scale adaptation solutions, noted by workshop participants, is especially important in light of the overemphasis on complex technological solutions to climate change in climate research [2]. The workshop findings also reinforce the important role of local women in supporting, teaching, and adapting traditional knowledge to adapt to climate change (reinforced by [42,40,43,70]). However, limitations of traditional knowledge (e.g., the perception that traditional systems for planting are becoming less effective as a result of climate change) were noted at the workshop and also have been mentioned in research in the Pacific [37,40].

Women in the workshop reported growing up in cultural and social environments that reinforce gendered intergenerational information flows, and reflect the need to bring women together across age groups to support knowledge transfer. The importance of women's roles in supporting and passing on traditional knowledge to the younger generation has been virtually unexplored in climate research, particularly, the role of women's groups in helping to document and preserve local knowledge. Such efforts are likely to increase in importance, as many of the women reported that traditional knowledge is being lost (a pattern noted in the Federated States of Micronesia; [41]). Specific recommendations for increasing support for local women's groups included increasing their access to climate finance opportunities, helping them to meet gender-focused funding requirements, and supporting their strategic planning. The resourcing of local women's organizations is key to supporting women's empowerment and providing a mechanism for them to express their needs and views on climate actions [2]. Moving towards gender-responsive climate actions requires broader geographic and gender participation in climate research and projects, and greater consideration of values and cultural understandings relevant to adaptation to better address needs, potential conflicts, and adaptation choices [15].

4.3. Key steps to support an enabling environment

An analysis of the capacity of governments to mainstream gender across policies and programs in fifteen Pacific Island countries and territories found that despite policy commitment, institutional responsibilities, and gender responsive project design, gender equality and empowerment of women often is not achieved [60]. The analysis identified key enabling conditions to support gender mainstreaming in the Pacific: supportive legislative and policy frameworks, political will to support gender equality, accountability for monitoring gender mainstreaming, and technical capacity and adequate resources to support gender mainstreaming.

Interestingly, participants from the workshop identified a different set of enabling conditions: reinforcing traditional knowledge and leadership, supporting women's groups, and policies that better address their needs and support their adaptation efforts (e.g., those that address the potential for violence against women and girls following disasters, limited infrastructure and support services for environmental migrants, and inequities of land ownership). While these enabling conditions often are not highlighted in the literature, supporting evidence for their importance exists and is discussed below.

The linkages between climate change and gender-based violence are rarely addressed in mainstream climate discourse, yet were noted as a priority in the Palau workshop, and reinforced by data from Vanuatu and Samoa [14,26,34]. Highlighting the potential for climate change to

exacerbate gender-based violence is therefore necessary to ensure that policies designed to protect women are reinforced and can be effectively implemented. Addressing these linkages is particularly important in the Pacific where most gender departments are under resourced, have limited capacity, and are not well integrated with government agencies responsible for the environment and climate change issues [60].

Support services for environmental migrants was another need identified in the Palau workshop. The reality of climate-induced migration in the Pacific has been documented extensively ([8]; Locke 2009; [47]), but the need for support services for migrants is rarely acknowledged. Notable exceptions include [13,50] who highlight the complex land-tenure systems of Pacific Islands and the challenges of finding land to resettle on following climate-induced migration where lands are under customary tenure. The confluence of environmental migrants, land tenure security, and gender and indigenous rights remains an area of intense debate in policy discussions. For instance, while the call for government policies that address land ownership inequity is a positive step, some have warned that increased land ownership for women may increase their work burden and may even jeopardize women's cultural rights to land [54]. There is a clear need to further study and develop equitable policy proposals.

The importance of addressing family planning in parallel with climate adaptation, noted by two participants from Papua New Guinea, is also rarely acknowledged in climate research. However, the need for improved reproductive health services and outreach by government and NGOs to provide maternal health/family planning was noted in two post-disaster needs assessments conducted in the region - in Samoa following Cyclone Evan [25] and in Vanuatu following Cyclone Evan [26]. Both assessments included input from gender specialists who incorporated gender analysis results into the assessment recommendations [1]. When the link between rapid population growth and climate change is discussed in peer-reviewed literature, it is usually in public health journals and at the global scale (e.g., [12,61]). Such findings reinforce the need to consider family planning approaches in climate adaptation projects and policies, especially where rapidly increasing populations are increasing demand for scarce resources and basic services and weakening the capacity to adapt to climate change.

5. Conclusion

Engaging women from across the Pacific to share guidance for improving climate adaptation policies and projects by better addressing the needs of women is an important first step. This research addresses key research gaps including the lack of empirical data on the gender impacts of climate change, the importance of traditional knowledge in climate change adaptation, and the lack of adaptation research that incorporates perspectives of local women. The research also helps to address the current biases in climate change policies and projects which prioritize western measures of gender equity (e.g., number of women in government) and scientific knowledge over traditional knowledge. It brings to light the need for broader engagement from non-western cultures to develop and shape policies to support gender equity and climate adaptation that also recognize women's traditional leadership roles. Their recommendations also highlight the diversity of perspectives surrounding women's empowerment and engagement in decision-making and reinforce the importance of considering multiple ways of achieving influence that are rooted in one's cultural values and traditional roles. This need is reinforced by feminist scholars who highlight the dangers of assuming non-Western women can, and should, follow the same path to empowerment as Western women [30]. Finally, the results also indicate that examples of climate projects further marginalizing vulnerable communities in Asia, Africa, and Latin America (e.g., REDD+; [38]) are playing out in the Pacific (e.g., increased vulnerability of migrants in Pohnpei). The input from Pacific Island women provides guidance for enhancing women's engagement and leadership

in adaptation planning, and highlights the importance of securing their access to resources, such as land, climate financing, and technologies, essential for gender equality, women's empowerment and resilience to climate change.

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