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Ancestral Voyaging Knowledge in Oceania - II



Taumako girls being supervised as they weave panels for a sail, Solomon Islands; @Mimi George

Pacific Women's Knowledge

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1. INTRODUCTION

Women's AVK

This paper provides an overview of the legacy, trends and importance of Pacific women's ancestral voyaging knowledge (AVK). At this key moment in history, Pacific countries and the United Nations are working together to mobilise knowledge of the marine environment to conserve and protect this globally vital ecosystem. Women hold important and irreplaceable AVK and skills of both local and trans-oceanic scope.

Women's navigational knowledge and their leading roles and skills as portrayed in ancient (mythic) characters, are foundational for present-day survival, and for future prospects for ecological and cultural sustainability and resiliency. There are now opportunities to mobilize and empower women AVK experts to transmit their skills and roles intergenerationally and transdisciplinarily. The fragile and complex web of this AVK could be employed in educational, scientific and community initiatives to protect biodiversity and meet contemporary and future needs of Pacific SIDS.

Women's AVK of the ocean, voyaging, marine and coastal climate and biodiversity are linked with women's customary rights and intangible cultural heritage. To prevent further decline of AVK it is necessary to make efforts at regional and national levels, to create an enabling policy environment, make linkages across knowledge systems, and give critically important support to intergenerational transmission of women's AVK. Programmes and policies based on this linkage of knowledge and rights, of nature and culture, create opportunities for young Pacific islanders who draw on their heritage to develop skills, knowledge and livelihoods, and reinforce their sense of identity. Transmission of AVK to girls and young women enables those who strive to apply this knowledge in pursuit of scientific careers and technical roles that benefit their communities and all citizens of the oceanic planet.

Gender equality from a global perspective

As the United Nations commences the UN Decade on Ocean Science for Sustainable Development, the role of indigenous knowledge of the marine environment is an essential component of multiple evidence-based (MEB) approaches to coastal and marine conservation, knowledge, rights and sustainable use. Whereas women already play an important role in oceanographic science, there is much less recognition and respect for the historical and contemporary role of indigenous women as holders of oceanic knowledge, and the potent role that transmissions of their knowledge could play in future understandings of how to protect island life, the ocean, climate, and biodiversity.

Gender equality is a global priority for UNESCO, and is linked to its efforts to promote the right to education, the right to support women in science, the right to advance the Sustainable Development Goals (SDGs), and the right to protect and promote various forms of heritage, including intangible cultural heritage. Through the Education 2030 Framework for Action, SDG 4 aims to 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all,' and SDG 5 aims to 'Achieve gender equality and empower all women and

girls.' UNESCO's programme on Education for Sustainable Development (ESD) empowers people to change the way they think and work towards a sustainable future.

The Youth Network initiative of the International Information and Networking Centre for Intangible Cultural Heritage in the Asia-Pacific Region under the auspices of UNESCO (ICHCAP) seeks to support women practitioners of Pacific intangible cultural heritage (ICH). Over the years, cooperation between UNESCO and indigenous peoples have centered work on intergenerational knowledge transmission. For example, The Canoe Is the People (TCITP) is an educational resource available in Maori and English on Pacific traditional knowledge of the ocean environment, including traditional open ocean wayfaring (www.canoeisthepeople.org). The Learners' Resource Pack, composed of a teacher's manual and student workbook, has been used in subregional teacher training workshops in Cook Islands, Solomon Islands and Aotearoa/New Zealand. The project requires further collaboration with Pacific countries, including with the Holau Vaka Taumako Association of Solomon Islands, to expand its content and scope, with the view to further integrate it into the formal education curricula in the region. TCITP offers an important platform for women Pacific elders and experts to pass on their specialized knowledge, skills and worldviews to Pacific youth.

2. WOMEN FIRST NAVIGATORS AND CULTURAL HEROES

Throughout the Pacific, women are regarded as original sources of navigation knowledge, and as cultural heroes who lead their people out of disastrous situations. Ancient stories and historical accounts across Polynesia tell of Hina, the "canoe pilot" and explorer (*Hina fa'auru-va'a* in Tahitia by Pape-au 1824 in T. Henry 1995), and Hinora (Hina, Sina or Sinora), the guardian of canoe trees in the forest. She protected her tree from thievery, then gave it to the thief after he apologized and requested it anew (as told by Kaveia in George and Kaveia, 1999; and in Kamakau;1961).

In other ancient stories, the daughter of a Chief of Pulap Atoll, Micronesia, was taught navigation by a Kuling bird. She then taught it to men (as told by Mau Piailug in http://archive.hokulea.com/index/founder_and_teachers/mau.html); and Pele, the goddess of fire and volcanos, steered the first vessel to arrive in Hawaiian Islands (Wilson-Hokowhitu, 2008), with her sister, Hi'iaka, nestled in her armpit.

Women cultural heroes designed and owned the first canoes. Liktanur of Marshall Islands brought the sail to Marshall Islands when she gifted it to Jebro, and when she passed on sailing techniques (Huffer, 2008 referencing Downing, et al., and Knight). In one Carolinian story:

"Ukura went on a canoe trip with her father, Suk. Coming home from Saipan to Satawal, Suk lost his way. They were drifting until they saw the white-tailed seabird also called Suk. The crew all wondered where the bird had come from. Ukurua called out "Father, why do you say you don't know where that bird is coming from? You told me that Suk lives north Fais, under the star of Weno!" So they turned the canoe to where the bird came from and sailed until they saw Fais." (www.thecanoeisthepeople.org website clip).

The first canoe in Nauru was designed by Eigomsij (according to Timothy Detudamo) to enable her people to fish for themselves. *Takitumu*, the canoe that first sailed from Cook Islands to Aotearoa was also named *Te tika a te Tuaine* (meaning ‘the permission of the sister’) for the woman who permitted her canoe to make the voyage. The Hawaiian culture hero Laka, who is commonly known as Goddess of the Forest and Goddess of Hula, built a Hawaiian voyaging vessel aided by a bird and the little people who worked at night (Kamakau, 1961). In Kiribati oral tradition, “an important navigator, Nei Mangani-buka, taught her son Teraka, who in turn becomes a celebrated navigator” (Huffer, 2008).

In ancient stories sometimes women are taught navigation by men. In one account a girl who was taught navigation by a man was the source of knowledge for Yap, Federated States of Micronesia. “An outer islander navigator who was staying on Yap... set out to teach the Yapese the art of navigation. He found that the Yapese was too old and slow to learn, but he had a young daughter who learned fast...the woman passed the knowledge of navigation to Fathaan, the chief of Ngolog in Rull.” (Hunter-Anderson and Zan, 1996). Sagur of Pulap Atoll instructed his daughter Inosagur, to feed the Kuling and eventually her doings resulted in killing the Kuling. In gratitude Sagur taught Inosagur navigation (Huffer, 2008).

Historically documented women navigators include Paintapu, who brought her vessel to safety through a storm between Tarawa and Abemama. She left the other vessels in their large fleet to be lost after they disrespected her navigational knowledge (Lewis, 1972 referencing Sabatier, 1955). Women as well as men were included in Marshall Islands *Rimedo*, the select group of navigators who generally came from the privileged classes. They “impart(ed) their knowledge only to their favourite children or others identified as worthy of their training” (Huffer, 2008 paraphrasing D’Arcy, 2006). German Ethnologists of the Sudsee Expedition, Kramer and Neverman, noted that women were teachers in Carolinian navigation schools (Finney, 1996:454).

3. RECENT WOMEN AVK NAVIGATORS

The rich mythological and prehistoric heritage of women in navigation is well attested, yet the visibility of women as marine knowledge holders has become obscure in recent history. Nevertheless, during the last 50 years, there have been various reports of girls and women being taught navigation.

Tewi Rewi taught his daughter swell patterns and other navigation skills using a stone canoe on Beru Atoll (Lewis; 1972). In 2005, Taunganga Anterea of Tabiteauea Maiaki, Kiribati gave an old notebook detailing navigational knowledge to a Peace Corps worker, Jaime Bach. Bach is now an anthropologist who seeks support to consult with other elders throughout Kiribati to interpret the meanings of ancient language to make it accessible to Kiribati youth. Tongia of Mauke Atoll, Cook Islands, told Elise Huffer about a Mauke woman named Te Roro Kai Etu. This name can be “translated to mean navigator, sextant, or recorder of important navigational stars” (Huffer, 2008). Lijon Ekniland from Rongelap told that she had “*knowledge of navigational ‘stories, legends and chants’ that she learned from her elders. She reported that she might have become a navigator and could have passed her navigation test when she was young*”

but was prevented for doing so by her father's death, and then by a move away from rongelap" (ibid).

During the 1990s - 2009, Taumako master navigator, Koloso Kaveia, taught his wife and daughter how to work with weather and sea conditions by deploying sticks, roots, lime powder and prayers. Kaveia, and then his wife and daughter gave such sticks to voyagers to use to direct squalls away from their vessel, and flatten seas that endanger their vessel (George, 2020b).

Kaveia also taught anthropologist Marianne "Mimi" George his ancestral system of navigation called *Te Nohoanga Te Matangi* (TNTM). According to Kaveia, TNTM uses a model of 32 wind positions around the horizon of the observer, and inter-relates patterned phenomena according to the wind positions in which they occur. The wind positions in which particular stars rise or set are correlated with particular weather that occurs when they rise or set. The wind positions at the solstices and equinoxes define the annual seasons and calendrics, which ~~also~~ correlate with-swell patterns, behaviours of animals and plants, lights one observes at sea, and ~~the~~ routes that voyagers choose. Kaveia asked George to create diagrams explaining how various phenomena are interrelated in the TNTM system, Kaveia reviewed and approved George's diagrams for accuracy (George, 2012, 2020b).

Women who were practicing navigators in the last century were described by their descendants. Jorelik Tibon's mother directed a fleet of four Marshall Islands canoes that sailed from Wotje to Majuro in a fleet of four Walap in the mid-1940's or early 1950s." A "political campaign" canoe was sailed through these islands by women (Genz in Huffer, 2008). Litormalu (or Taramalu) whose mother was from the "clan of Kwajalein" married a man who landed on Namorik after being lost at sea. "Litormalu was taught by her adopted father and another man, from the time she was a small girl. She learned how to navigate by reading weather and other signs, (including) birds, rocks, swells and waves; and by learning chants associated with navigation." (Huffer, 2008).

Rosemary Lafilmai Apusa of Satawal was the granddaughter of the late Lourdes Lapanemai of Satawal, Micronesia, who was trained in navigation. She explained that Lapanemai was chosen by her father because she was quiet and did not talk a lot...which meant she would be unwilling to give away secrets of navigation. Teueroa, was a renowned i-Kiribati navigator, and thus an authority of environmental knowledge. One time when maritime authorities of Kiribati could not find a lost ferry for over a week, they asked Teueroa to do so. She found many of the bodies and body parts that were still floating after the ferry had sunk. At the time of the article about that feat she stated that she wanted to teach anyone. When Teueroa was told about climate change, she said that she did not believe that what was happening now with the changing climate was completely new or different from what has happened before. She referred to the prophetic role of the stars (Robertson, 2018).

Kaveia of Taumako lived about 98 years. He knew other women who were navigators and voyagers. One of these was Joslyn Sale of Pileni Atoll, who died in 2014 at about 105 years old. When young she sailed throughout Santa Cruz Islands of SE Solomons on vessels owned by her father. After marrying, Sale sailed on vessels owned by her husband. Her daughter Joann Hahala was First Mate on, and navigated, her father's vessels for 17 years. In the 1990's, when Hahala

was at least 70 years old, she still owned the most canoes at Pileni Atoll. Sale told Mimi George about her older cousin Hoakena of Pileni. Hoakena owned a *TePuke* and campaigned it throughout northern Santa Cruz Islands from about 1920 until WWII. Hoakena navigated and captained the vessel, which she acquired from Basil Tevake of Nifiloli.

4. WOMEN'S AVK NETWORKS

Ancient interisland networks throughout the Pacific include vital connections between Papuan and other non-Austronesian language-speaking peoples in what is now Indonesia, Papua New Guinea and Australia. Some of these were formed well over 30,000 years ago. Relationships between inland coastal, seafaring and land-based peoples were added to and extended as Lapita voyagers settling out islands along the Bismarck and Solomons chain, and reached Vanuatu, Samoa, and Tonga about 3000 years ago (Kirch, 2015). Subsequently other voyagers arrived, including Tongans who were campaigning their large vessels throughout the Pacific prior to the advent of colonizer laws and policies that banned and suppressed voyaging.

Many trans-oceanic networks were established by relationships through women. Matrilineal social organisation is still strong in the Western Pacific, providing the basis for inter-island relationships and alliances (Kayser, 2006; Howe, 2007). Even in the eastern Pacific, women are known to have inherited their *mana* (ancestral power) through their mothers. In many cases *mana* was more important to the future of descendants than what came to them through paternal lines (Gunson, 2016). Histories of Polynesia recount numerous sacred women chiefs and female 'headmen' (Linnekin, 1996). In numerous cases women became public leaders when men were not able to, or when circumstances became dire (ibid.).

Today, women AVK practitioners hold the potential for reviving sustainability and resiliency across the Pacific by virtue of their extensive network of interisland relationships. These networks are a virtually untapped resource, as such. Yet women's networks are organisational and AVK keys to recognition and restoration of endangered species, protection of remaining biodiversity, and reduction of the drivers of climate change.

Very few women are able to go on voyages today. Those who do so have opportunities to re-activate socio-cultural networks that undergird AVK as well as local, regional, and trans-Pacific communication and cooperation. Women AVK experts at home and overseas practice both local and universal aspects the ancient knowledge. Contemporary women voyagers can seek to identify and learn AVK from them and as they do so they will be reviving AVK networks.

5 WOMEN AVK EXPERTS OF THE WESTERN PACIFIC

Today, women who know the most AVK, and use it in daily life, are located in the western Pacific (Nuttall, et alia, 2022). Some of these communities are attempting to revive use of AVK, and to renew partnerships and networks between communities of faraway islands, by teaching young people to build vessels and navigate them between distant islands. Groups that use AVK are located in Milne Bay and Admiralty Islands of Papua New Guinea, Taumako / Duffs Group

of SE Solomon Islands, the Lau Group of Fiji, and the Central Caroline Islands (George, 2021b and 2021c).

In these AVK groups women produce ancient designs, materials, methods and tools, needed to make ancient vessels and navigate them to other islands. They also use AVK in everyday life to increase resilience of their communities in the face of natural hazards and emergencies such as rising sea levels and climate change. These AVK experts see the need to transmit their AVK practices to youth as urgently as possible to halt biodiversity loss and support its restoration and preservation.

In these Western Pacific communities women navigators are remembered, and some are still active. Girls and young women who stay at home normally learn various forms of AVK from their mothers, aunts, and grandmothers, as they actively practice AVK skills in everyday life. Some young women are eager to learn to be AVK navigators, and in some communities some women are trained, or supported, to do that. Some do so quietly because those roles and opportunities are often not approved of or supported by their school or church.

6. GENDER DIFFERENTIATED ROLES AND SKILLS

Most women do not learn or practice AVK navigation at sea. Much has been written about the gender differentiated roles and skills Papuan and Australian Aboriginal cultures. Yet, there have been and will be exceptions to such rules, just as there are among Micronesian, Polynesian, and other peoples. Also, gender roles change through time within the same communities and cultures. Social scientists have observed that “changes in gender relations since colonization, and in ways of life more generally, ensure that what counts as ‘tradition’ is often quite different from past constructions of customary practices and values” (MacIntyre and Spark, 2017:13).

In the 1970’s-1990s, many voyaging revival groups did not want women and girls on their vessels. Some were afraid that government officials, policy-makers, and religious leaders would punish the families of women who went to sea. Some claimed that women never went on voyaging vessels. Others expressed concern that women would be in danger at sea. Nevertheless, more women and girls have gradually found their way onto student crews and have been becoming experienced navigators in many of the revival voyaging groups. In recent years, many of these women have been able to do this when there were government and educational sources of funding that supported participation by girls and women. However, many more girls and women want to learn AVK, and learn to sail and navigate on interisland voyages, than currently have the opportunity.

Outstanding examples of this in urban-based voyaging revival societies are trans-Pacific voyages lead by women navigators of Tonga and Tahiti. In the case of the Polynesian Voyaging Society (owners of the double hulled vessel *Hōkūle‘a*), in recent years a majority of apprentice navigators and younger leadership positions are being held by women.

One example of an AVK-based voyaging group that has made steps toward including women as regular crew of voyaging is that of Taumako, SE Solomon Islands. This community had only a

few women passengers and crew until 2014. However they have aspired to create an all-women's crew to accommodate those women who want to learn to sail and navigate. Consideration of the roles of women on vessels again has been a matter of some disagreement, but the *'Lata'* (traditional leader or leaders) of a vessel has the right to decide in each case. In some circumstances a woman is restricted from going on or near the vaka if it rests near a venue segregated for men. However, when women are needed as crew or passengers the restrictions do not apply.

For women to voyage on traditional vessels often requires negotiation and new agreements within communities and families. Today that must happen between those communities and governmental and religious officials and educators. Many groups that work to revive education of youth in voyaging heritage are concerned about what the safe and appropriate gender roles for contemporary women and girls are now. Many of the contemporary women who want to go on voyages need to learn ancient protocols about how, when, and where women can participate.

7. INTER-ISLAND NETWORKS

Now that there are severe sustainability pressures on island communities, the roles and statuses of women and girls are changing. For AVK, and most indigenous knowledge systems, to remain robust and dynamic requires daily practice. People practice AVK because it has functional value for the practitioners. Women use AVK practices and technologies when working in gardens and forests, on reefs and in the ocean. When women grow cash crops rather than grow, gather, or wildcraft diverse plants and animals for their own uses and purposes, the results are that they are increasingly detached from the practice of being guardians and custodians of biodiversity, and young people do not learn how to be guardians and custodians. Thus knowledge loss occurs both on the home island and on other islands that are part of the networks of islands that make sustainability and resilience possible for each island community. The ill effects cascade unless there are viable networks. The women, their children, and their communities adopt diets that are known to cause diabetes and other diseases linked with inadequate nutrition. Junk food' diets require cash to buy, and this increases reliance on cash economy rather than more healthy subsistence lifestyle foods.

To attain and maintain food security and backup resources in the event of natural hazards. In this scenario, island communities do better when they have women and children who learn and practice AVK in their own islands and engage with communities on other islands that have resources they need. active relationships with people of other islands in their region. Women's relationships, particularly in inter-island marriages, are key to maintaining strong interisland relationships. Sociocultural relationships are strongly linked with care of shared or complementary resources.

Now, girls who learn AVK in the ocean are very few, and this is linked with the fact that there are very few functional inter-island and interregional networks. The current lack of inter-island and interregional networks results in fewer opportunities for women to go ocean sailing. Revival of such networks would create greatest opportunities for revival of women's AVK, and vice

versa. Women's ocean going AVK skills, partnerships, networks and strategies are required for regional sustainability and resiliency.

8. WHAT WOMEN AVK EXPERTS CAN TEACH

Among the AVK roles and skills that Women AVK experts can teach are:

8.1 How To Be AVK Passengers, Crew and Navigators

Women AVK experts who are experienced in open-ocean sailing and navigation can teach girls how to be weather workers, 'passengers', and navigators (George, 2020a, 2020b, 2020c). Traditionally, even novice passengers are expected to help the more experienced crew members. Some women AVK experts can teach navigation for passages between particular islands and island groups. Some can teach weather prediction before a voyage, and some can teach modification of weather and seas while sailing on a voyage.

Central Carolines AVK voyaging groups that do not currently have women as crew have expressed concerns about the safety of women at sea, as well as the need to keep complementarity and balance between culturally different roles of men and women. Many indigenous islanders are now accustomed to models and rules of gender behaviors that were introduced by missionaries. Some Micronesian men AVK experts who are willing to teach girls have expressed that they do so because the threat of losing the knowledge is so very dire. Yet they lack programmatic and bureaucratic support for their efforts, and are frustrated by norms and/or policies of the past century/ies of coloniser impacts.

Today many are reconsidering what are the appropriate gender roles for their women and girls (Huffer, 2008). When there are safe opportunities for girls to learn, women's AVK people decide whether to take advantage of, or support those opportunities. There are gendered roles and skills that most live by. There are also individuals with interest and ability who were allowed to learn regardless of their gender. When AVK educational programmes and classes are open to all genders, then women can become students of either normal or exceptional roles and skills. Parents and communities can decide which roles and skills their girls will learn based on the benefits they see for the girls and for their communities.

8.2 How To Reconnect with People of Other Islands

Experienced women AVK voyagers can teach how to engage in relationships and exchanges with people of other islands, and how to rebuild and sustain alliances between different peoples and communities. In many traditions, women who move to a different island when they marry. In doing this they learn protocols for inter-island relationships and they carry their genealogies with them. They learn who is related to whom and what sorts of gifts and resources were shared and could still be shared.

8.3 How To Weave Sails

Students of AVK sail-making must learn what plants to use, when and how to pick, soften, and cut the leaves. To do all this effectively they must learn how the sails should perform when sailing, and how the matting will be maintained and repaired. Teaching these skills is critical to revival of trans-Pacific AVK because Pandanus sails are reported to be in normal ‘everyday’ use on the traditional vessels in only one Pacific community—Taumako, Duffs Group, Solomon Islands. Numerous women of Taumako can teach other Pacific communities how to weave panels for Pandanus sails for seafaring use. In this they are unique. Many Pacific communities want access to sail-making practitioners who make them for normal seagoing use rather than for museum displays or public ceremonies).

Today, almost everywhere, AVK sails and cordage have been replaced by modern materials and machined production methods. Woven sails are now made of plastic tarps or rice bags. Fiber or vine cordages are now Nylon, Dacron, and Polypropylene. A key consequence of not using AVK plants is that women no longer monitor and care for them. Today many young people do want to learn to make Pandanus sails and sennit, bark, and grass cordages, and revive the supply of the plants needed for such AVK technologies. Using plants according to AVK methods helps maintain ecological diversity.

8.4 How To Make Cordages

Some women, old people, and children throughout Papua New Guinea, Solomons, Carolines, and other island groups still prepare, twist and braid sennit and bark cordages. Groups of Taumako adults stand in long lines twisting together large strands of bark cordage. Women and children of many Pacific Islands prepare the raw materials for making cordage. In Caroline Islands it is groups of men and boys who sit in a circle chanting, pulling, and twisting strands sennit cordage into ropes. Many types of cordage are necessary for lashing, rigging, and repair of various parts of AVK vessels. Today such cordages are mostly used in construction of homes. The women who make the various types of AVK cordage can teach others more of the AVK applications of this green technology.

8.5 How To Produce Foods

Women teach children how to plant and tend gardens (on land that men clear), raise pigs and chickens, dry and ferment voyaging foods. Women teach how to harvest, gather, and prepare foods for everyday and seasonal uses, and for feasting events that mark maturation rites of each person, as well as during construct or maintenance of a voyaging vessel. Women feed elders and men as a daily obligation, voyaging crews, and the general population when voyagers arrive.

8.6 How To Make baskets

Women teach how to make baskets for every use, such as carrying or storing foods, firewood, medicinal plants, leaves for earth ovens, gifts for a bride, and special baskets for the needs of very young or very old people,. Women also teach making leaf-panels for daily use and for building homes, weavng sails, and panels for the roof and walling of shelters on voyaging vessels.

8.7 How To Manage Marine and Island Resources

Women teach how to use and manage most of the plants, animals, rocks useful gardening and baking, water useful for drinking and washing, and many other resources needed for building, sailing and navigating voyaging vessels. Women teach how to use natural materials, such as coral stones and mangroves, to steward fish / sea life and plants that reproduce in estuaries, reefs, and lagoons.

8.8 How To Balance Relationships

As people who have traditionally cared for land and resources, women teach others how to balance the requirements for biodiversity and resiliency of biota and natural resources with the needs of people.

8.9 How To Teach Protective Values, Ethics, and Relationships

Women teach the values, ethics, and relationships that protect the environment and ecology as they train children how to observe, grow, and manage resources. Women teach how to cooperate and engage in common purposes of protecting resources necessary for sustainability and resilience of ocean / island life. Women bring children with them as they fish, garden, and gather (including harvesting of spider webs for kite fishing), and when they feed, wash and train pigs, birds (including chickens and tamed birds), fish (including sharks), and other animals. Matrilineal relationships through island groups and regions still provide a basis for re-establishing networks and collaborations that were fraught by colonial borders and policies.

8.91 How To Respond to Change

Women monitor and strategically respond to conditions and growth of plants, animals, reefs and shoreline, weather, water sources, tides, currents, swells. Because women usually do the collecting of water for drinking and washing of children and clothing from fresh-water lens wells and from streams, they are aware of the conditions that lead to, or hinder, good water supply. Because women must travel and work in gardens, gather firewood, fish, etc. according to the state of tides, currents and swells, women are also keenly aware of regular cycles and changes that are happening in coastal and ocean water conditions. They do not over-harvest when they see that conditions are going to stress certain plants, or when they observe signs that the seasonal rains will not be adequate in future weeks or months, or even during the next year.

8.92 How To Practice Health and Healing

Women practice the healing and healthy arts, including Romiromi massage, use of medicinal plants, dietary practices, and disciplines that promote maturation and spiritual growth.

8.93 How To Reconcile, Negotiate, and Make Peace

Women teach reconciliation and peace-making as daily practices and as a process between confirmed and long-term adversaries. AVK reconciliation and peace-making disciplines are highly developed and time-tested models for inter-cultural negotiations and conflict resolution (Fry and Kabutaulaka, 2008).

8.94 How To Identify and Define Land Rights

Women teach their descendants what their rights and responsibilities are regarding particular land, reefs, animals, plants, and sky and ocean phenomena such as weather.

8.95 How To Tell Ancient Stories

Women teach children by telling ancient stories at appropriate times. These include star stories at bedtime, origin stories at gatherings, during ritual events, and during confrontations and negotiations.

8.96 How To Make Music, Dance, Poetry

Women teach dances, chants, poems that convey ancient knowledge about phenomena and relationships. Women's compositions are rich in themes and characters about community and inter-island relationships between people, plants, animals, weather, and other sky and ocean phenomena.

8.97 How To Know What is Gender Appropriate

Women teach how to perform skills and roles that are gendered as well as genderless, non-conforming, in everyday life, on voyages, or when such action is appropriate to assert rights to resources

8.98 How To Know When and How to Lead More Publically

Women AVK experts teach when and how women should assume appropriate leadership in their communities and allies. They know from experience when it is, or would be, appropriate for women to publically do what men usually do. Both men and women in matrilineal and/or matrilineal (and matricentric) societies, know that women are agents of their lineage in important situations as well as when male leaders are indisposed or incapable.

8.99 How To Birth and Raise Children

Women teach how to birth and raise lineal heirs, share children, care for elders, as per cultural norms and legacies. This can include such everyday actions as placing babies in canoes to rest or to play. In this way babies and infants become accustomed to the feelings of ocean swells and movements. Another example is naming of babies with the name of the person responsible for the place where the baby is born. This links the baby with that place and with the lineage responsible for it. This gives the baby rights and responsibilities in that place and with that lineage.



*Preparing breadfruit to feed workers in a feast and to dry for rations of a voyaging crew.
@ Mimi George*



Loading parceled foods into an earth oven to be eaten in a feast honoring the memory of a family member. @ Mimi George



Weaving a basket to give to a host family @Heu'ionalani Wyeth



Taumakoan girls being supervised as they weave panels for a sail @Mimi George



Taumakoan women and girls prominent in launching a newly constructed vessel @ Mimi George

9. WOMEN'S AVK CURRICULA AND CONTENT IN FIVE GENERAL CATEGORIES

Schools have enormous potential and responsibility to make women's AVK education available to students because girls are in school so much of the time at least 5 days a week, and because AVK education has not been connected with formal curriculum in most schools across Oceania. It is urgent that educators work with AVK expert educators to create and implement women's AVK curricula in schools.

Many middle-aged and older women of remote islands who did not go to school did learn AVK and can teach it. The expertise of these women is needed to create hybrid AVK / science curricula, and to teach the AVK content.

By studying both science and AVK, students can consider the differences and similarities. There are such hybrid curricula being utilized in some schools that can serve as general models, such as the Aotearoa-produced *Learners Resource Pack* (see <https://www.canoeisthepeople.org>), and the STEM voyaging curriculum and lesson plans being used in some schools in Hawaiian Islands.

There are women's AVK experts living in Aotearoa and other locations with indigenous Pacific Islander diaspora communities. These women could teach AVK skills much more than is now happening. Girls in primary, secondary and college levels of schools can be paired with women's AVK experts to be mentored in AVK. They can also document that knowledge and consider how

it relates to climate change and environmental concerns, write reports, papers, or compose artworks, distribute them on social media, and submit them to educational and scientific media.

Women's AVK and hybrid-AVK curricula contents may be divided into five general subject areas, as outlined below.

9.1 Women's AVK Plant and Animal Inventories, Uses, and Care

Women AVK experts show their students how to grow, protect, harvest and process plants for various uses. Now that people see how plastics harm the environment, youth want to learn AVK technologies. To do this the students need access to the plants and instruction by AVK experts who know about how to grow and care for them. Use of AVK plants protects diversity because women are very aware and concerned when the resources are declining or at risk.

9.2 Women's AVK Food Security and Resilient Agriculture

AVK Food production is performed, and is taught, in sync with voyaging activities, and voyaging activities occur in sync with seasonal patterns, cyclical and irregular weather trends, plant and animal life cycles, etc. Voyages are undertaken when there is abundance of food to support the activities. Voyages are also made during times of food shortages when there is need to go to other islands where there are food surpluses (Kuehling, 2021).

Types of food production are responsive to intermittent emergencies such as cyclones, tsunamis, volcanic eruptions, global warming, etc. Gardening and gathering must accord with patterns of plant behaviors. Processing and storing foods involve aerobic and anaerobic fermenting, drying, smoking, and salting. Women AVK experts can teach how to do all of this.

9.2B Women's AVK Care for Water, Soil, Stones, Reef

Women AVK experts teach the sources of water for drinking and washing, and how to monitor and maintain those sources under varying conditions, during various seasons, etc. Women AVK experts teach about the soil (gardening and fallow areas), and stones (useful for baking ovens, for construction of foundations and insect-free platforms, and for sharpening tools). Women AVK experts teach the intricacies of tidal and currents on reefs, the needs and habits of flora and fauna (coral, seaweeds, fish eggs and fry, shellfish, turtles, eels, squid, and other animals that frequent reef and lagoon areas), their life cycles and the conditions they need to thrive.

9.3A Women's AVK Vessel Construction and Maintenance

Each time an AVK voyaging vessel is built, sailed, or navigated, women AVK experts can teach youth AVK plant medicines, basket and cordage-making, food preparations, weaving of sails and mats, weather forecasting and moderation, appropriate vessel behaviors and maintenance, how to make and maintain relationships with people of other islands. Both Aotearoan and Hawaiian Islands peoples now lack access to the AVK voyaging vessels and some of the voyaging technologies that their ancestors used in traveling to where they are now.

9.3B Women's AVK of Making Sails and Cordage

AVK sails are proved more powerful, efficient and maintainable than modern sails (DiPiazza, 2017; George, 2018). Since the 1970s much has been written about voyaging 'revival' groups located at more industrialized, and often large, islands such as O`ahu, Hawai`i, Maui, Aotearoa

(NZ), Fiji, Rarotonga, and Tahiti. For over 45 years these groups have followed the example of Polynesian Voyaging Society as they built and sailed modernized vessels (Finney, 1979, Howe Ed., 2007) and used star navigation methods that were created in Bishop Planetarium (Kyselka, 1989; Low, 2013). Because there were no women AVK experts for sail making in Hawaii by the 1970's. Two times Hawaiian weavers failed to create sails that would not rip open in 2-3 knots of wind. Yet those who use traditionally woven sail panels report that the sails provide strength and flexibility in case of heavy winds (George, 2017). Similarly, fiber cordage was not being made in Hawaii, and sennit from Fiji, Kapingamarangi and other Pacific islands was not employed for structural lashings of Hōkūle`a and other Hawai`i-based vessels Thirteen Okeanos-produced vessels also use modern sails and cordage.

By contrast, some Micronesian, Solomon Islands, Papua New Guinean, and other AVK-rich communities continue to depend on women to perform roles and skills that are critical to successful voyaging, such as providing foods, weaving mats for sails, and contributing natural materials needed to make cordage. Male voyaging crews act on behalf of their matrilineal relationships with people of other islands. Micronesian men twist and braid strands of sennit cordage from fibers that women and children have prepared. Women AVK experts in production of natural sails and cordage are members of communities that still rely on these technologies. Just before they died Marshallese and Chamorro women have recently instructed young women how to make Pandanus sails. Today Taumakoan girls weave sail panels for actual use on seagoing vessels. Recently, woven Pandanus sails were made on order of museums in Europe, and some Micronesian, Hawaiian, and Maori youth have begun trying the traditional sail materials at sea. AVK cordage-making and sail-making are very popular subjects and very suitable for AVK hybrid educational programmes in schools.

9.4 Women's AVK to Prepare / Conduct Voyages and Create Relationships / Projects

Women prepare food supplies for voyaging crews, materials and equipment needed for emergency repairs, and appropriate gifts and items for exchange with people at other islands. A lot of food is required to assist or care for people of other islands who are affected by disasters, as well as for the traditional ritual feasting, maturation rites, marriage negotiations, and celebrations that occur in profusion upon arrival of a voyaging canoe.

Women AVK experts renew and create active alliances and networks and coordinate efforts between women, or the families of women, that offer resilience in fairly common natural disasters. Women do most of the gardening, fetching of water from wells, and harvesting of wild fruits. When women are not able to communicate with their counterparts on other islands they cannot strategize about what to grow, learn what is not growing well, and figure out what to do about it. Currently most women AVK experts lack ways to know if help is needed on another island, and do not have the means to offer assistance, or to plan ahead for doing so when the need arises.

Furthermore, women's AVK practices are heavily impacted by destructive effects on plants, animals, reefs, forest, ocean and ocean resources by commercial extractions, pollution, climate change, and lifestyles committed to the global economy and urban jobs. When there are voyages women AVK experts are positioned to share information with each other, and they all gain

powerful perspectives about what can be done to support biodiversity and sustainability at home islands, reefs, and inter-island regions.

9.5 AVK of Balance, Peace, and Reconciliation

AVK voyaging groups acknowledge that women are agents of connection and balance within and between voyaging crews and communities. Traditionally, voyagers should not go to sea until all is settled and peaceful at home. The negotiation of past and future relationships is of utmost importance when voyagers arrive at an island. Women are skilled practitioners of AVK peace and reconciliation methods and negotiations. When issues arise over use, sharing, and protection of resources, women are ideally positioned to analyse problems from genealogical and matrilineal perspectives. Because of this women can teach students the dynamics of conflict in ways that men are not as knowledgeable about or are not as able to speak of.

10. CHALLENGES / OPPORTUNITIES FOR TRANSMISSION OF WOMEN'S AVK

The multidimensionality of women's AVK provides rich opportunities for intergenerational knowledge transmission. Children and youth who learn a wide range of women's AVK, including ocean voyaging, would benefit from the detailed and systematic understanding of coastal and marine environments and ecologies that AVK offers. Women's AVK teaches them how to restore and protect the ocean and the oceanic networks of people and natural phenomena between islands. All of this can bring multiple benefits, including building resilience against climate change and providing livelihood for the local communities.

Women's AVK skills are highly relevant and applicable to current concerns of indigenous communities, scientists, and educators, as well as policy makers who seek to foster sustainable development in their nations. While many men pursue paying jobs, women have more responsibilities for gardening, gathering, and other hands-on environmental work. What the women do, and their ability to apply AVK as they work in their maritime environments, is critical to the success of any efforts to maintain biodiversity and care for marine environments.

In traditional societies, intergenerational transmission of women's AVK happened normally, and was necessary for survival. Today, voyaging groups that use ancient designs, materials, methods and tools in vessel construction, still need women to make the cordage, weave the mats, and produce the food. Communities that still depend on, or hope to revive, diverse island / ocean resources need their children to learn from women. Women's arts include production of building materials, medicines, commodities, stories, and gifts. Sustainability and resiliency of island and coastal communities, and of the very land, water, and biota of marine areas, depends on transmission of women's knowledge and production (Salopuka, 2018).

10.1 For transmission of women's AVK educational assets

In the enthusiasm to ensure education for all, indigenous knowledge systems have usually been pushed aside in favour of formal education in classrooms. There is a major challenge for Pacific SIDS to see education as being enriched and informed by the multiple evidence base for knowledge and observation. Creating synergies between formal school education and AVK

informal education could be transformative and boost the role and status of girls and women as expert knowledge holders.

It has been observed that “gender ideologies can be challenged indirectly through projects emphasizing the value of education for all children” (MacIntyre and Spark, 2017:14). In many cases policy changes are required for transdisciplinary collaborations to thrive. There are still opportunities to recognise, document, and support transmission of women’s AVK, including women’s navigational practice”(Huffer, 2008; Wilson-Hokowhitu, 2019). The following needs must be met for transmission to occur.

10.2 Connection with AVK Experts, Ecologies, Experiences, and Phenomena

For girls to learn AVK from experts, they need access to communications with women AVK experts. AVK experts who live on different islands need access to dedicated transport to bring students and AVK experts together, and they need dedicated spaces where women and girls can gather to teach and practice their skills.

In the past, many fewer girls living on remote islands were attending school. In recent decades many more girls are in school and are able to attain secondary or university levels. The result of this is that woman-to-youth transgenerational transmission of women’s AVK has been breaking down.

Cultural instruction requires guided experiences of oceanic ecologies and phenomena, and girls require time with AVK experts to learn the advanced AVK of the marine environment. In the families of groups who know and practice AVK, many parents must leave their islands for paying employment, often on multi-year contracts and with no practical or affordable transport to go home during holidays. Most children of communities where the most AVK is practiced must leave their islands for education. As long as they are enrolled in school they cannot return home for holidays when is no reliable or affordable transport.

The challenge is evident in that most urban and school-bound girls do not know how to swim, garden, or manage animals and plants in their environment. Mastery of AVK skills and roles are transmitted through decades of experiential learning that teaches one to distinguish between long term natural cycles and short term changes. Girls who learn gardening, weaving, cordage-making, weather-work, preparation of voyaging foods, are able to learn more when they can observe and understand how their creations work at sea. Girls need to learn from women who experienced being passengers, crew and/or captains of AVK vessels, and who know how to connect with people at distant islands. Boys need to know that women’s AVK exists.

Collaborations with voyagers who use modern technology could be very helpful. Today there are some experienced women navigators and seafarers from voyaging revival groups. Most well-known are those from Fiji, Tahiti, Tonga, Samoa, and Hawaiian Islands. They use sailing vessels made of modern materials, and non-instrument navigation methods that are not AVK. These women also want to learn AVK, and they especially want to go to sea with women AVK navigation experts. They want to learn proficiency in navigating by more ancestral relationships with phenomena than they have learned in their own revival voyaging societies. Girls must make voyages to participate in gatherings or meet family members on other islands or who go to other

islands to find a spouse, to marry or to live with a spouse. In doing so they become engaged with the ancestral oceanic phenomena that connect the people of different islands.

This new generation of women voyagers has emerged after decades of women apprentice navigators not being welcomed into voyaging crews. Similarly gradual increase in modern acceptance of women as revivalist voyaging crew members and navigators has occurred in Hawaiian Islands, Aotearoa (New Zealand), Tahiti (Society Islands), and Fiji. Some traditionalist AVK groups such as Holau Vaka Taumako Association (and formerly Vaka Valo Association), have set goals to train all-women crews and have already had women crew on inter-island voyages.

To voyage across international boundaries, women need passports and visas. To acquire these, women need policy changes. When official and church policies require women to have written permissions from their male family members and stamped approval from officials., and when the offices that issue such documents are overseas from the home islands of women, then the expenses and time required to acquire the documents are prohibitive. Many of the rules and policies date from colonial and wartime administrations. In the present there are many policies that hinder transmission of AVK practices and education, and equal participation in sustainable development.

- Women AVK experts and many young students need the introductions and tools to do outreach themselves and make partnerships with NGOs. NGOs of interest include scientific and academic researchers and commercial eco-tourism enterprises. These partnerships grow when women AVK experts and their students co-create programmes that grow or increase sustainability and resilience of island communities and of the oceans fish ponds, and revival of inter-island AVK networks that were constructed to do exactly that. Examples of such programmes include protection of diverse island and marine plants, animals, water sources, stones for making earth ovens and tools, and licies to prevent pollution, and harmful mining and logging practices.
- A first step towards cocreation of knowledge is for women AVK experts of inter-community and inter-island voyaging groups to meet in workshops to establish their needs and decide what is appropriate for women experts of AVK to teach girls. Women AVK experts of each community can propose to teach those gendered skills and roles that they see as appropriate for them to teach. Issues of balance and complementarity must be considered. The women should be able to directly convey their decisions to community, government and religious leaders.
- To assure cooperation and cocreation with women AVK experts, it is necessary to start programmes at the community level, then the all-island level (if there is more than one community on the island or island group), and then between islands within and between national governments and internationally. For planning meetings to occur, and to carry out ongoing teaching sessions, women experts of AVK and their students need dedicated transport, communications, spaces, and accommodations for those who must travel to be together. These arrangements must be made and funded before the meetings occur. Small

island residents do not have banks or extra cash, or even access to communications and transport.

- Many girls want to sail on AVK vessels and need access to them. Few of the voyaging revival group vessels are made with AVK materials, designs, and methods. When AVK vessels are available women AVK experts can organise an effort to construct them. If that is not possible then modern vessels must be available so that women's AVK experts can use them to teach girls the skills and rolls of crew and passengers, and how to navigate, and connect, or reconnect, with communities of distant islands.
- Urban women AVK experts need appropriate social platforms to perform / teach stories, songs, dances, poetry and to perform maturation rites. Traditionally, when women are working, or socializing, together, creation and transmission of song and dance forms occurs. As noted earlier, there is little opportunity for creating or transmitting the arts when children are in school and mothers are working to earn the money to pay school fees and buy uniforms, medical care, and store goods. The content of stories, poems, and songs, and maturation rights, all-night dances, and other ritual performance events, inform people about environmental phenomena and relationships between people and other beings.
- Education system policies should allow broader access school facilities and grounds, as well as off-campus locations for student learning. Even on remote islands educators should make school spaces available when needed by AVK experts. Educators should also allow students to leave the school grounds with AVK experts who must teach them on the reef, at sea, in the bush, etc. At the present time there are many policies and expectations that prevent this happening in many schools.
- Women AVK experts and their students need suitable transport to connect with representative AVK women on other islands to discuss and arrange marriage partners. When a ship arrives at a place like Taumako the visit may be for only an hour or two and there is no time for inter-family meetings. When a voyaging canoe arrives, it is common that prospective marriage partners be identified, and a series of gifts and negotiations follow in what was, and still can be, a long process leading to marriage. The marriage and family-making steps require further inter-island visitations. Conservation programme collaborations between intermarried families are much stronger than between strangers.
- AVK marriage partners and/or their children usually gain rights to resources, and some maintain garden plantations on multiple islands. These arrangements are especially advantageous to the family, and their extended families, during different seasons, or when droughts, cyclones, or other temporary conditions that make some islands unlivable. The current lack of access to distant islands makes women unable to take advantage of their marital rights and opportunities. This decreases the viability and resiliency of their communities.
- Women AVK experts need help to plan, travel (transport) and re-establish relationships so that they, and their communities, can establish the best ways to access plants, animals,

etc. from other islands, atolls, or reefs. Each island has particular resources and lacks others. For example Taumako, a high island, has hardwood trees suited to construction of vessels and volcanic stones suitable for earth ovens. Taumako, also has an abundance of sago palms, the leaves of which are best for house roofs and wallings. Outer Reef atolls do not have those resources, but atolls like these often have an abundance of fish, turtles, nuts, and breadfruit that high islands do not have. Sharing and trade of these things makes life sustainable throughout the islands. With rising sea levels and stronger, more frequent, storms, the atoll people must move to higher islands, adding pressure to inadequately diverse resources.

- Dedicated and culturally appropriate times and spaces are required for girls to learn from women AVK experts. Transmission of AVK about how to support environments and biodiversity requires that students learn during all seasons as well as through multi-year cycles of climate, plants, animals, etc. Access to AVK teaching must be continuous throughout all levels of schooling if the students are to achieve mastery.
- Local, regional, trans-regional and trans-Pacific workshops between women experts and leaders of ancient voyaging knowledge could contribute to the perpetuation of women's AVK. Women AVK experts may need help organizing educational workshops between women of different islands to enable them to reconnect and help each other teach children, share knowledge, and involve girls appropriately in traditional and modern activities. When providing support to women AVK knowledge holders in organizing events and workshops, partners are encouraged to consider women's leadership, capacity building, local needs, and culturally appropriate methods.
- Women AVK experts need access to communications with their counterparts and students of AVK on other islands. They need to travel with them to survey and manage plants, animals, and other resources used to build vessels, houses, tools, weather work, gardens, make medicines, etc. They also need access to communications with national and international NGOs, so that they can co-create and collaborate on educational projects.
- Dedicated transport is required for inter-island workshops and for elders and students to go to gardens, bush, gathering places, fishing sites, story sites, logging and other harvesting venues. When government, educators, NGOs can provide transport, AVK transmission and transdisciplinary co-creation may be possible.
- Safety gear and clothing are needed for sea travel by women AVK experts and their students, to gather materials and learn with experts, to conduct plant and reef resource surveys, to train what to do as crew or passenger on vessel, what their roles and protocols are, etc. Women AVK experts and students can carry out programmes when they have basic safety equipment for the purpose.
- Young students of women AVK experts need access to, or creation of, project / programme media platforms to convey their detailed observations and understandings of the changes in climate and biodiversity that they deal with.

- Women AVK experts must be directly engaged by educators, law and policy-makers for successful collaborations and for creation and development of research and support programmes involving transmit their ancient AVK roles and skills. Governments, experts, educators, voyaging societies, environmental and conservation NGOs, and private sector should guarantee free prior and informed consent approach and ensure that the actions are of mutual benefit.
- Fair compensation for women AVK experts their are required for the women experts to be able to work with interisland communities or with NGOs. In the past the work of women AVK experts has been unrecognised and without at least a moderate salary they cannot participate. Often this is because they cannot train others or arrange for others to take on their responsibilities if they are pre-occupied with educational programming. When AVK experts work with others there is almost always a need for food to be provided to participants in sharing of AVK skills and knowledge. Often the foods consumed are strongly related to the type of skills and knowledge being taught.
- Scientists and technology researchers should speak the native language of women AVK experts for appropriate and/or advantageous access to women AVK expertise. If the scientists and technologist do not know the language well, then university students for whom the native language of the experts is the first language, and who were born and raised in the island community of the woman AVK expert should be hired. It is much preferred that the student be a woman.
- Public and written clarifications and changes in policies by government and religious leaders are needed for women's AVK to be equally included in educational and cultural programs. Policy changes are required for women and girls to communicate freely with government officials such as education and cultural planning offices (Salopuka, 2018, 2020)
- School and community education programmes can be created for continuous construction and maintenance of AVK vessels and for navigating them between islands. Schools and expert practitioners of women's AVK can co-create and collaborate on such experiential programmes in which AVK experts teach how to build and sail AVK vessels..
- Any existing programmes for women AVK expert teachers and practitioners should be extended to reach out to girls and students attending higher education institutions, and to primary and secondary schools. For urban-dwellers, gathering venues are required for AVK interaction, sharing, telling stories, learning and socialising with peer groups and practitioners.
- Women AVK experts require more supported opportunities to perform their traditional teaching methods in the environment where the materials and ecologies that they can teach about, or where such resources cannot be constructed, grown, or protected and maintained. Women AVK experts cannot teach most AVK knowledge and skills in classrooms or school grounds that do not have the resources needed.

- Videographic documentation of expert women teaching many skills can be archived for eventual use as adjuncts to in-person teaching and may be shared with other communities, as appropriate. Subjects of videographic recordings may include recognition and use of navigational signs, performing maturation rites, telling stories about, and personal experiences of, inter-island voyages and vessel-building, demonstrating the steps of harvesting and weaving sail panels and making various types of cordage, demonstrating birthing and childraising methods, teaching songs and dances with voyaging content, showing management methods and uses of plants needed to build vessels, etc.
- Urban workshops should be held with women AVK experts and school educators, to co-creating curricula and lessons for city-dwelling and boarding school students to learn about women's AVK skills, roles, and relationships, and how those practices support biodiversity.
- Workshops are needed between women AVK experts, governmental culture offices, and tourism planning offices, to design research and to plan touristic information and ventures that engages equally and appropriately with women experts and supports transmission of women's AVK.
- Workshops are needed between women experts of AVK and women captains and crew of modern technology vessels, such as yachts, fishing boats, and government-owned vessels. The AVK experts can be supported in carrying out their programmes, and the women with access to modern technology (such as Okeanos vessels) can learn from those experts in the process.
- Women AVK specialists could assist in organizing workshops. Indigenous Pacific women who captain and crew on revival vessels using modern technology could offer transport and seagoing capabilities in support of women's AVK workshops and teaching programmes.
- Internet communications devices should be provided to all women's AVK experts and the girls or young women who are their student assistants and organizers. With this access the women AVK experts can communicate with each other and coordinate women's AVK education programs of regional and global scope.
- Social media (especially low-data platforms like Facebook) and a renamed and rebranded, interactive, and easily, cheaply, accessible website (to replace canoeisthepeople.org) should be utilized for awareness and communications within and between voyaging groups across Oceania, and for awareness and fundraising efforts internationally.

11. CONCLUSION

The 29 recommendations outlined in section 10 above (“**FOR TRANSMISSION OF WOMEN’S AVK EDUCATIONAL ASSETS**”) are the result of author consultations with leaders and members of 80 voyaging groups, including 56 AVK-based groups and many educators and scientists who want to work with them (George, 2021b). All of these groups recognise that women’s AVK skills and roles in sustaining ancestral voyaging knowledge and associated knowledge of the marine environment, are of exceptional value for present and future protection and restoration of biodiversity and ecosystems. Women AVK experts offer an irreplaceable and necessary interface of culture and science, and of livelihood and adaptive innovations.

The Pacific region could benefit enormously from the synergies of gender empowerment and the multiple evidence base approach to environmental and climate knowledge for the benefit of people and planet. The vital link between nature and culture could be enhanced within the framework of achieving sustainable development.

Women’s fine-grained AVK is critical to defining and monitoring what the key resources are for sustainability and resilience in particular islands and island network. These resources include the availability of adequate fresh water, gardening lands, reef, shoreline, and ocean conditions, plants and animals. This baseline environmental knowledge of women AVK experts is also critical to documenting, monitoring and understanding what is changing in the ocean, the climate, reefs, forests, water sources, garden lands, plants and animals of the Pacific.

Women’s AVK relationships, social roles and skills are key to mobilizing co-creation of knowledge and cooperative actions that can renew and conserve Pacific resources. Transmission of AVK to girls and women is not an anachronistic idea, or a nostalgic grasping for the past. Rather, transmission of women’s AVK to youth opens a new frontier in coproducing new knowledge, and in bridging both formal school education and traditional education and skills building.

Transmission of AVK is a practical way to enable indigenous peoples of the Pacific to bring their AVK into decision-making that will shape the UN Ocean Decade and inform gender equality in environmental education, as well as career or life journeys. By creating, supporting and collaborating with programmes in which women AVK experts can transmit their roles and skills, the partnerships and transdisciplinary projects will be formed that will co-create AVK data, models and strategies for sustainable development.

To create a context in which women knowledge holders can apply AVK for the benefit of the communities and of humanity at large, requires that transmission of women’s AVK embedded in a larger scale project of national, regional and international interest and importance. Women’s AVK transmission programmes could be initiated and supported under Pacific SIDS, working to the inscription of AVK as intangible cultural heritage, and could be taken up under the programmes on natural sciences, ocean science, or in the programmes and policies of both formal and informal education.

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