Meet PNG's female mangrove scientist

Mazzella Maniwavie

by Mazzella Maniwavie and Ruth Konia[1]

I grew up with a natural laboratory in my backyard and a father for a scientist, so my job is a dream come true. I have always wanted to follow in my father's, Thomas Maniwavie's, footsteps, who himself was a marine biologist and renown mangrove scientist in Papua New Guinea - Mazzella Maniwavie

Papua New Guinea (PNG) is home to some of the most intact and diverse mangrove forests in the world. Women and children, particularly, rely heavily on mangroves for fuel wood for cooking, and for fish, crabs and shellfish for household consumption, and sale for cash income. Mangroves also provide a buffer from storm surges and coastal erosion. PNG's coastal mangroves, however, are under threat by development and clearing, which means no fish or crabs and less protection to villages from storm waves and erosion.

But there is a growing group of women in PNG who are determined to help protect these important forests. Meet Mazzella Maniwavie a young PNG mangrove scientist passionate about supporting communities and especially helping women to understand and protect these incredible forests using the best local indigenous and scientific knowledge available.

I first met Mazzella in 2019, where she worked with The Nature Conservancy (TNC) with communities in Milne Bay Province on a Mangrove Restoration Training and Mangrove Forest Assessment. Our team at TNC quickly realised how knowledgeable Mazzella was about mangrove science and how good she was at working with communities. We wanted more!

At the time, Mazzella was well into her pregnancy with her first child. Being a mother myself, I suggested we perhaps postpone this work until after the birth of her baby. However, this strong-minded woman refused my suggestion and said, she "missed the mangroves" after spending a year and half studying for her Master of Science in Marine Biology and Ecology at James Cook University in Australia. Mazzella endured long hours in the mangrove patches, despite being heavily pregnant, and worked with communities to complete the first ever mangrove forest ecology assessments along the coasts of Dadue, Divinai and Bubuleta villages on the east coast of Milne Bay Province.

As a child of a mangrove scientist, the mangroves were her natural playground. From crawling under the roots, soaked in mud, to climbing the trees and hopping from branch to branch like a monkey, the mangroves were deeply entangled into her being like the veins that runs deep in her body and soul.

> *"She will take only a single glance at the leaves or fruits of any mangrove tree and will tell you the scientific name and the latitude they grow in without having to refer to a manual. Such in depth knowledge of a habitat was just fascinating,"* said Senita Wauwia, Field Coordinator, Mangoro Market Meri Program.

Mazzella built on her childhood knowledge and her formal education to produce the "Community-based mangrove planting handbook: A step-by-step guide to implementing a mangrove rehabilitation project for the coastal communities of Papua New Guinea." In 2014, Mazzella's work with mangroves was recognised when she was awarded the "Young Achiever" Westpac Outstanding Women Award with a scholarship to study for a Masters degree in Business Administration. This award acknowledged her outstanding leadership in mangrove restoration work in PNG.

> *"As the youngest person at the time, receiving an award for my contributions to community mangrove conservation came as a surprise to me as other recipients were focused more on community development and this was the first time someone in the environment sector had been successful. I was delighted that this recognition highlighted both the importance of mangrove ecosystems and was a credit to my late father's work. The event itself was significant in propelling me towards becoming a professional in mangrove conservation in PNG,"* said Mazzella.

Mazzella is now employed full time with TNC as Mangrove Scientist with the Mangoro Market Meri Program.

> *"The Mangoro Market Meri Program has ambitious objectives that need scientific and technical expertise. We are very excited and confident that with Mazzella on our team, we will be able to achieve our objectives and pursue scientific rigour and excellence",* said Robyn James, TNC Asia Pacific Gender Advisor.

The Mangoro Market Meri Program brings together women from across PNG to support sustainable mangrove management for the benefit of improved livelihoods, including tourism, women's empowerment, food security, "blue carbon" storage, and the protection of coastal communities from sea level rise and storm surge (Konia et al. 2019). Mangoro Market Meri is building a platform for women to generate income based on the sustainable management of their mangroves. Potential economic opportunities include building local markets for sustainably harvested mangrove products such as

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shellfish and mud crabs (short term), exploring the potential for ecotourism (medium term), and preparing to engage in blue carbon sequestration (long term). It is a partnership between several key partners, including women leaders from communities across the country, provincial and national government, academic institutions, non-governmental organisations and businesses.

The overall aim of the Mangoro Market Meri Program is to demonstrate the economic benefits that can flow from mangroves, ensuring these benefits are shared equitably, which can incentivise the sustainable management of this important resource. I asked Mazzella to share some thoughts on mangrove protection, and this is what she said.

"During my childhood it was all fun tagging along and exploring nature. The thing that drew me most to this field eventually was my father's passion for healthy environments and the lessons he gave about how nature looks after our needs and how our behaviour towards the environment determines our very existence."

"Growing up, the villages neighbouring where I lived on the University of Papua New Guinea Motupore Island Research Station, had large areas of diminishing mangroves. People heavily depended on their mangroves for raw materials, and population growth resulted in big areas of mangroves being destroyed for settlements. I saw resources diminishing and marine pollution being the greatest threat to marine life. My father's mangrove restoration initiative helped nature to return to some state close to what it was originally. Witnessing this firsthand really empowered me to pursue this field and be part of conservation actions in PNG."

"In order to preserve our Pacific way of life by the sea, we need to look seriously at the way we treat our marine environment. You can be a passive mangrove user without knowing it – the crabs and fish that you buy from the market, the clean air you breathe and the mangroves that protect you from storms are all connected to healthy mangroves. And you can be an active mangrove user – harvesting wood and seafood daily. Mangroves connect the land and the sea and their health reflects how we humans behave on land and towards the sea."

"One of the biggest gaps in bringing mangrove conservation work forward in PNG is the establishment of mangrove protection laws. Mangrove protection especially in this age of rapid coastal development and climate change is so important. My role at The Nature Conservancy and the project I am currently involved in puts me in a strategic position to work closely with government agencies and other conservation partners to bring this agenda to fulfilment. More importantly as a woman who grew up in an environment where I witnessed how women are the biggest users of mangroves and depend heavily on mangrove forests for income to look after their families, it gives me a greater sense of obligation to be an influence in creating gender sensitive mangrove forest management regulations."

"Our greatest challenge in the Pacific is climate change, if we do not use our mangroves wisely, we will have no defence against climate change and we will end up losing our way of life, and our identities."

"In terms of climate change, on average, mangroves can store three to five times more carbon than upland tropical forests, mostly in soil (https://www.greenbiz.com/article/why-protecting-blue-carbon-storage-crucial-fighting-climate-change). A valuable green solution to reducing global warming lies in this unique habitat. Thus, conserving mangroves through community-based sustainable forest management is our best option. It is my greater goal that blue carbon projects are fully explored in PNG and that communities and especially women can receive benefits. Blue-carbon, which refers to the carbon stored in soils and plants in marine wetlands, including mangroves, seagrasses and saltmarshes, have a greater potential to be developed to a stage that returns alternative economic income for coastal communities and in return contribute to reducing global greenhouse gas emissions."

"While blue carbon ecosystems such as mangroves, seagrass beds and saltmarshes constitute only 2-6% of the total area of tropical forests, their degradation emits the equivalent of 19% of the annual carbon emissions from global deforestation" (https://www.thebluecarboninitiative.org).

The road has not been easy for Mazzella, especially growing up in PNG, a patriarchal society where women and girls are classified as "good for the kitchen, raising children, tending to the farm animals and taking care of their husbands' needs and not doing science!" Despite this, Mazzella, has become PNG's Specialist in Mangrove Restoration and Conservation. As we ended our conversation, this is what Mazzella had to say for her daughter Louisa, who is barely a year old.

"Kids being raised in the city and living far from natural settings, tend to live separately from how their actions contribute to environmental problems. For instance, a kid throwing trash in a city drainage system cannot see how this plastic ends up in the sea and affects marine life. This is my greatest challenge, but also an opportunity since my child is young and that my job itself can be a great influence in imprinting pro-environmental behaviour. I think my greatest dream for my daughter is to do what will make her happy but at the same time when I look at her as an adult in the future I want to see someone whose life is filled with events influenced by instilled wise environmental decisions."

Reference

Konia R., Masike B. and James R. 2019. Mangoro Market Meri: women working together to protect their mangroves and build secure futures for their communities. SPC Women in Fisheries Information Bulletin 30:30–33.

Mazzella Maniwavie, Senita Wawai and Ruth Konia conducting mangrove forest ecology assessment training. ©TNC