

January-March 2023

# Kyeema Newsletter

## Words from our CEO

The 20th year of operation for the Kyeema Foundation has already seen a number of changes for the organisation! Most important of these is a change in leadership of the Kyeema Board. After a four year term as Chair and many years as a Board member, with close involvement with the governance of the organisation since inception, Dr Robyn Alders AO is stepping down as Chair.

Robyn has dedicated her career to family farmers in sub-Saharan Africa, Asia, and Australia with an emphasis on the development of sustainable infectious disease control in animals in rural areas, in support of food and nutrition security. Robyn was the first female veterinary scientist to be made an Officer of the Order of Australia (AO). In 2017, she was the recipient of the Inaugural Mitchell Global Humanitarian Award which recognises Australians and others supported by Australian aid who have made an outstanding contribution to the cause of international development. We have been honoured to have a female leader with such passion and accolade as our Chair and cannot thank Robyn enough for her guidance and wisdom as Chair. In this period, Robyn has presided over wonderful growth in the organisation while ensuring that we remain committed to our mission to assist marginalised communities. Robyn has always been ready to provide her wealth of technical expertise both in the field and on team calls.

Her commitment to scientific rigor and ethical practice will remain a hallmark of our work at Kyeema and we welcome her new role as a Member of Kyeema and continuation of her technical expertise to those most in need.



Dr. Robyn Alders



KYEEMA FOUNDATION

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Celebrating the Contributions of  
Women in Science at Kyeema:  
Kyeema's Journey of Empowerment  
and Impact  
| PAGE 4

---

## Nutrition, Health and Livelihoods

Core Country update  
| PAGE 7

Promoting Local Chicken Small  
Business to Mitigate the Impact  
of COVID-19 on Rural  
Vulnerable Women  
| PAGE 11

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## Resilient Communities

Mangroves and climate change:  
Building resilient communities on  
the frontlines of climate change  
| PAGE 14

Reflecting on a community-led  
nature based-solution to  
support survival of coral reefs in  
the face of climate change.  
| PAGE 16

---

## Innovation

Challenge Fund Projects  
2022 Round  
| PAGE 19

Oyster Heaven: Biofilm innovation  
for oyster reef restoration  
| PAGE 21

Of course coming into the role as Chair we welcome Sinéad Magill. Sinéad is the Managing Partner for Europe, Middle East and Africa at Palladium. She has 20 years' experience leading large scale programmes with a focus on humanitarian response and sustainable development. Sinéad oversees Palladium's UK portfolio, delivering projects in over 20 countries. These projects address critical development needs including health security, agricultural livelihoods, climate and nature based solutions. Sinéad has a passion for delivering impact and supporting organisations leading transformational change for the most vulnerable. A strong advocate for women, Sinéad was featured in Management Today's 35 under 35 and won the UK Women of the Future Business Award. We are delighted that Sinéad is on board to continue with the Kyeema tradition of strong, value-driven Board leadership.

*"As Chair of Kyeema, I'm proud to be working with AJ, the team and the rest of the board to guide Palladium through the next phase aligned to the new strategic plan.*

*This plan keeps close to Kyeema's roots of community-based innovation but broadens our scope into new and exciting areas impacting communities around the world including initiatives to address the climate crisis whilst sustaining livelihoods; to provide jobs for refugee communities or displaced people; and to mitigate the devastating impact of climate change through responsive humanitarian programming. In the years ahead, our scope of work will expand as too will the partners we engage with. If you're interested in partnering with Kyeema, please reach out directly".*

*– Sinead Magill*



As promised in earlier correspondence our 20th year of operation is already proving to be a hallmark year for Kyeema. In addition to changes in our Board chair we also want to extend our heartfelt thanks to Chris Lee, in addition to being a relatively new father and celebrated author Chris has contributed wonderfully to the Kyeema strategic direction. Chris has stepped back from his Directorship but maintains his Kyeema Membership for which we are grateful. While losing one Director we have also gained a very experienced Kyeema hand on the Board. Celia Grenning returns to a Board position to offer her sage advice and enthusiasm to the organisation she has driven for so long. Great to have you back as a Director Celia!

In anticipation of greater growth and renewal for the organisation we have also reopened membership of the organisation accepting nominations through the last quarter of last year and at our most recent Annual General Meeting affirming a genuinely exciting range of new Members for the Kyeema family. Our new Membership, who are now also eligible for Director roles includes a great mix of long time Kyeema supporters and new entrants to the Kyeema family. We are happy to welcome:

- |                  |                    |                    |
|------------------|--------------------|--------------------|
| • Robyn Alders   | • Joe Ichter       | • Janine Griffiths |
| • Pat Boland     | • Robert Le Busque | • Joyce Onguglo    |
| • Nick Clinch    | • Chris Lee        | • Joost Verwilghen |
| • John Copland   | • Ricardo Michel   | • Mary Young       |
| • Celia Grenning | • Jabulani Nyenwa  |                    |

Each of the new and returning Kyeema Members, hailing from around the world brings their own experience and wisdom to the organisation and we look forward growing with the benefit of their expertise and welcoming new Members through an annual renewal and refresh process. If you're interested in becoming a Member of Kyeema please reach out to me at [anthonyjc@kyeemafoundation.org](mailto:anthonyjc@kyeemafoundation.org).



We have also enjoyed success with some other funding partners. I was lucky enough to make a trip to PNG with the Kyeema team last month to sign a tripartite memorandum of understanding with the National Capital District Commission and the Motu Koita Assembly. This is primarily for Kyeema to undertake mangrove and coral reef restoration activities funded by the United States of America State Department on the land and waters of the traditional owners – the Motu Koita people. This represents a great example of the way Kyeema is undertaking our work –



in partnership with community and key stakeholders. Organised by the dynamic NCDC executive James Ume the signing, attended by the Port Moresby City Manager, Ravu Frank, US Government Embassy Economic Chief, Geoffrey Grimes, Director for Community and Social Services, Janet Haua, and representatives of the PNG Conservation and Environmental Protection Authority, was much to my surprise a feature of the PNG national news service (EMTV) that night and for three minutes we were able to bring attention to the work need to restore the waters around Port Moresby.

As you will note from the excellent blog pieces below, we are continuing the work envisaged at our inception, nearly 20 years ago. Doing our best to fulfil our commitment to marginalised communities and their environments in partnership with local organizations and focused on empowering individuals and communities to build their own capacity and create lasting change.

Despite some recent successes and a good plan for growth we, like many others around the world, need funding to continue our work. Hence in addition to the thanks for contributions so far, we are requesting your generous support and funding. Your contributions and your promotions to friends and contacts will enable us to continue our work on the ground, providing support and essential resources to those who need it most. By supporting Kyeema Foundation, you are not only helping us to continue our important work, but also making a tangible difference in the lives of those who need it most. Your support is vital, and we are grateful for any contribution you are able to make.

Please enjoy the reflections below and don't hesitate to reach out if you have any queries, thoughts, or suggestions around our work and particularly funding opportunities.

Anthony Carrigan





# Celebrating the Contributions of Women in Science at Kyeema: Kyeema's Journey of Empowerment and Impact

Women from around the world make significant contributions across all fields of science; and it is particularly fitting that we here at Kyeema take time to celebrate those achievements. Kyeema has been driven over the past 20 years by women committed to the pursuit and application of scientific knowledge to assist marginalized communities and their environments.

Founded to promote animal health and welfare as integral to human health and prosperity, Kyeema was formed by a group of Australian veterinary and agricultural scientists who wanted to promote a model of sustainable Newcastle disease (ND) control for village chickens kept by rural families globally. ND, which is endemic across Asia and Africa, kills 50-100% of chickens every time there is an outbreak, destroying the economic and food security of entire communities and contributing to the seasonal struggle with crop food shortages.

## A Look at Kyeema's Pioneering Women

Dr Robyn Alders AO and Celia Grenning were pivotal in the establishment of the organisation and are involved to this day. Until recently Robyn, a celebrated veterinary scientist, was Chair of the Kyeema Board and she now remains a Board Member of the organisation in a technical advisory role. Throughout the years, Robyn has worked closely with small-scale farmers in sub-Saharan Africa, South East Asia and Australia as a veterinarian, researcher and fellow farmer, with an emphasis on the development of sustainable infectious disease control in animals in rural communities and regenerative agriculture to support improved food and nutrition security for all.

Celia, an agricultural scientist and international development practitioner, led the organisation as a volunteer CEO since inception in November 2003 until her retirement in May 2022. She continues to give her time as a Board Member and Finance Manager. Celia has been a career advocate for rural women and has worked tirelessly to expand Kyeema projects to communities throughout Africa, Asia and the Pacific, with a focus on female headed, resource-poor households through improving the health and productivity of their household chickens. This, at the most practical everyday level, enables access to better income generation, food and nutrition security, healthcare and education for women and their families.



*Celia Grenning (left) and Robyn Alders (right) attending a program meeting in Africa.*





*Rosa Costa with a technical resource for improved village chicken keeping and sustainable Newcastle disease control.*

Dra Rosa Costa, another veterinarian, is a Kyeema Board Member, and our regional lead in Africa, based in Mozambique. She has worked with Kyeema since its inception and is a pivotal player in our programmatic reach in Africa. There is probably not a veterinary scientist in Mozambique who has not been taught, mentored, or inspired by Dra Rosa. With a specialist training in veterinary pathology and central laboratory management, Rosa has worked with government, civil society and private industry to empower animal health professionals and improve the lives of smallholder farmers across Africa.

The story of her career progression in the aftermath of Mozambique independence from the Portuguese in 1975 is intriguing and exemplifies how women in science have worked tirelessly, with passion and dedication, taking risks and overcoming great challenges to make things happen and create a difference in their field.

Veterinarian Dr Mary Young, a senior technical advisor for Kyeema, has played an important role in the field of veterinary vaccine development and supply chain management. With a deep understanding of the challenges faced in delivering vaccines to remote and rural areas, she has dedicated her career to building quality and sustainable approaches. Her work with governments across Asia and Africa has been instrumental in establishing vaccine production facilities that have improved access to animal vaccines. But her impact goes beyond just production.



*Mary Young (bottom, 4th from right) and Bethlehem Zewde (bottom far left), the Kyeema Ethiopia Director, at the African Union-Pan African Veterinary Vaccine Centre (AU-PANVAC).*

Dr Young in addition to Dr Alders and Dr Costa also supported the development of the first veterinary cold chain manual with the Australian Centre for International Agriculture Research (ACIAR). It aims to support practitioners to deliver safe and efficacious livestock vaccines to the most challenging environments and is used to promote best practice. Mary remains an invaluable resource to the Kyeema technical team, providing technical support and acting as a mentor to our staff in-country. Through her guidance and support, she is helping to build capacity and strengthen the team's approach to vaccine distribution and supply chain management. Her career long work to improve livestock vaccine access and efficacy is a testament to her dedication and expertise in this field.

Dr Eliza Smith is a highly skilled and versatile member of the Kyeema team – with us since 2015. She is a trained veterinarian with a strong foundation in ecological science. She brings a wealth of expertise and experience to her role as technical lead, where she provides guidance across a range of projects. With a focus on applied research, project coordination, and Monitoring, Evaluation and Learning (MEL), Dr Smith has worked in the international development sector across Africa and the Pacific over the last 10 years. She has worked in 'livestock for development', veterinary public health/'One Health', and more recently, nature-based solutions to address the impacts of climate change.

Dr Smith's unique combination of skills and experience make her an asset to Kyeema and the communities it serves. Her dedication to improving the lives of marginalized communities connected intrinsically to environment, and her passion for science make her a valuable leader in the field.



*Eliza Smith with a village elder in Uganda learning about local medicinal plants used for treating livestock.*

Throughout the years, Kyeema has been driven by women committed to the pursuit and application of scientific knowledge to assist marginalized communities. These women, who bring a strong foundation of evidence-base practice to their work, have dedicated their careers to improving the health and prosperity of communities and environments throughout the world. Thanks to them all, Kyeema evolved from having a unique focus on development of sustainable infectious disease control in village poultry in rural areas, to a broader support for improved food and nutrition security, truly locally led marine resource management, and the establishment of regenerative agriculture for sustainable livelihoods, especially for women.

Kyeema looks to put its funding where our values are by working towards greater opportunities for women in scientific research, professional development, and advancement. As an organization, we are committed to addressing gender bias and discrimination by promoting diversity and inclusion, and by implementing policies and programs that support women in science and technology careers. Our goal is to encourage and empower young girls and women to pursue education in science fields, by providing access to resources, role models, and opportunities that inspire and support them on their journey.



## Core Country Update

Our core country programs in Africa and the Pacific continue to champion small-holder farmers to improve their nutrition, health and livelihoods.

### Mozambique

The three master trainers in Mozambique concluded the implementation of their small projects under the Pilot of Master Trainer (MT) courses in Africa to improve Newcastle disease control in village chickens' project in partnership with the African Union Pan-African Veterinary Vaccine Centre (AU-PANVAC) and submitted the reports on the following projects.

- Cold Chain assessment in 2 districts of Tete province; Angonia, and Mágoè
- Strengthening of ND Disease Epidemiological Surveillance System in 8 villages of Macate and Sussundenga Districts
- Effectiveness of I-2 Thermotolerant Vaccine for Newcastle Disease Control in Manjacaze District

The 'Promoting local chicken small business to mitigate the impact of COVID-19 on rural vulnerable women' project in Marracuene has ended, but a monitoring visit in January 2023 revealed that the female-run units are progressing well and continuing to generate income for their families. Farmers are benefiting both financially and nutritionally from the sales of chicks, chickens, and eggs. The Marracuene project is being expanded and will continue under DFAT ANCP funding with a focus on measuring impact for women's empowerment in the livestock sector.

Poultry vaccination campaigns in three districts (Búzi, Caia, Machanga) under the Sofala Province Water, Energy, and Food Security Project (SWEF) have faced delays due to vaccine shortages. However, there has been an overall increase in household vaccination rates, thanks to data collected by District Services of Economic Activities (SDAE) and International Institute of Tropical Agriculture (ITTA) technicians working together on the project.



## Ethiopia

Kyeema Ethiopia continues its Newcastle disease control vaccination project in Aleta Chuko and Aleta Wondo, having signed a partnership agreement with both Woredas to select, train, and equip additional Community Vaccinators (CVs) for the March 2023 vaccination campaign. So far this year, 37 new CVs, 20 Kebele Animal Health Assistants, and 11 old CVs were trained or refreshed in Aleta Wondo. The ANCP pilot of Master Trainer courses in Africa to improve Newcastle disease control in village chickens is being implemented in collaboration with AU-PANVAC, Vet Aid in Kenya, and Kyeema in Mozambique. Kyeema Ethiopia has also established a new partnership with Bahir Dar University to provide Training of Trainers (ToT) to 5th year Veterinary students and present guest seminars on relevant topics, as well as to establish an engaging ‘family poultry’ club for undergraduate students as part of the establishment of a veterinary vaccine business challenge working with smallholder farmer clients.

## Malawi

In the previous vaccination campaign in Dowa East, more than 24,000 chickens were vaccinated across 2,000 households. Currently, all four Extension Planning Areas are conducting their first vaccination campaigns for the year, with the next round scheduled to continue through April. To ensure the success of these campaigns, the Rural Poultry Centre team will be holding review meetings this month with government officials, community leaders, and community-based poultry workers (CBPW).

The Rural Poultry Centre is making steady progress towards its goal of establishing a Farmer Field School (FFS) in Chadza, which will include disability-inclusive consultation and design. The FFS approach is an educational approach that provides smallholder farmers with training and extension services to improve their knowledge and skills in agricultural production. By organizing farmers into small groups and teaching them in a participatory and experiential manner, FFS aims to increase productivity, improve incomes, and enhance food security in communities facing challenges such as low productivity, poverty, and food insecurity. The RPC has already purchased land for the FFS and is actively working to develop inclusive facilities that will be accessible to all members of the community. By prioritizing inclusivity, the RPC hopes to make the FFS a valuable resource for all farming households in Chadza, enabling them to access the training and resources they need to improve their farming practices and enhance their livelihoods.



## Papua New Guinea

The Ala Ala project is set to conclude in March, and a request for an extension is under review. The community has asked for an additional coral nursery site, and thanks to the donation of an outboard motor from Kairuku MP, monitoring is now easier and safer. Ala Ala community members have played a critical role in promoting community involvement in nearby Yule Island, and the strong links between these areas have helped garner widespread support for Kyeema's initiatives.

As part of the REO USG Project, Kyeema, the National Capital District Commission (NCDC), and the Conservation and Environment Protection Authority (CEPA) initiated stakeholder consultations in January to extend their work to Bootless Bay and coastal communities in Port Moresby. Thanks to the engagement of the Motu Koita Assembly, who represent Port Moresby's coastal indigenous people, Kyeema has the opportunity to meaningfully support local communities for improved One Health outcomes. In March, the team began scoping and implementation, and with the help of Kyeema Master Farmers and the Yule Island nature-based solution project participants, multiple nurseries were set up in Pari village.

Under the ANCP PNG program, Village Chicken Master Farmers have been focused on maintenance and production, preparing for two community training workshops next quarter. They have also encouraged chicken and egg sales, with two Master Farmers selling between 30-50 eggs per month. Kyeema's Coral Garden Master Farmer, Kevin Egu, has been monitoring the growing coral nursery site in Tubusereia and managed a small bleaching event. The Tubusereia site, which covers nearly 200 sqm, has become a thriving habitat for returning fish and sea life. Kyeema's Master Farmers have been leading village chicken, coral gardening, and mangrove restoration activities throughout the PNG program, inspiring community members to protect, manage, and restore their local marine systems and maintain their future food security and livelihoods.



*NCDC, Kyeema and CEPA in Pari village for a scoping trip*



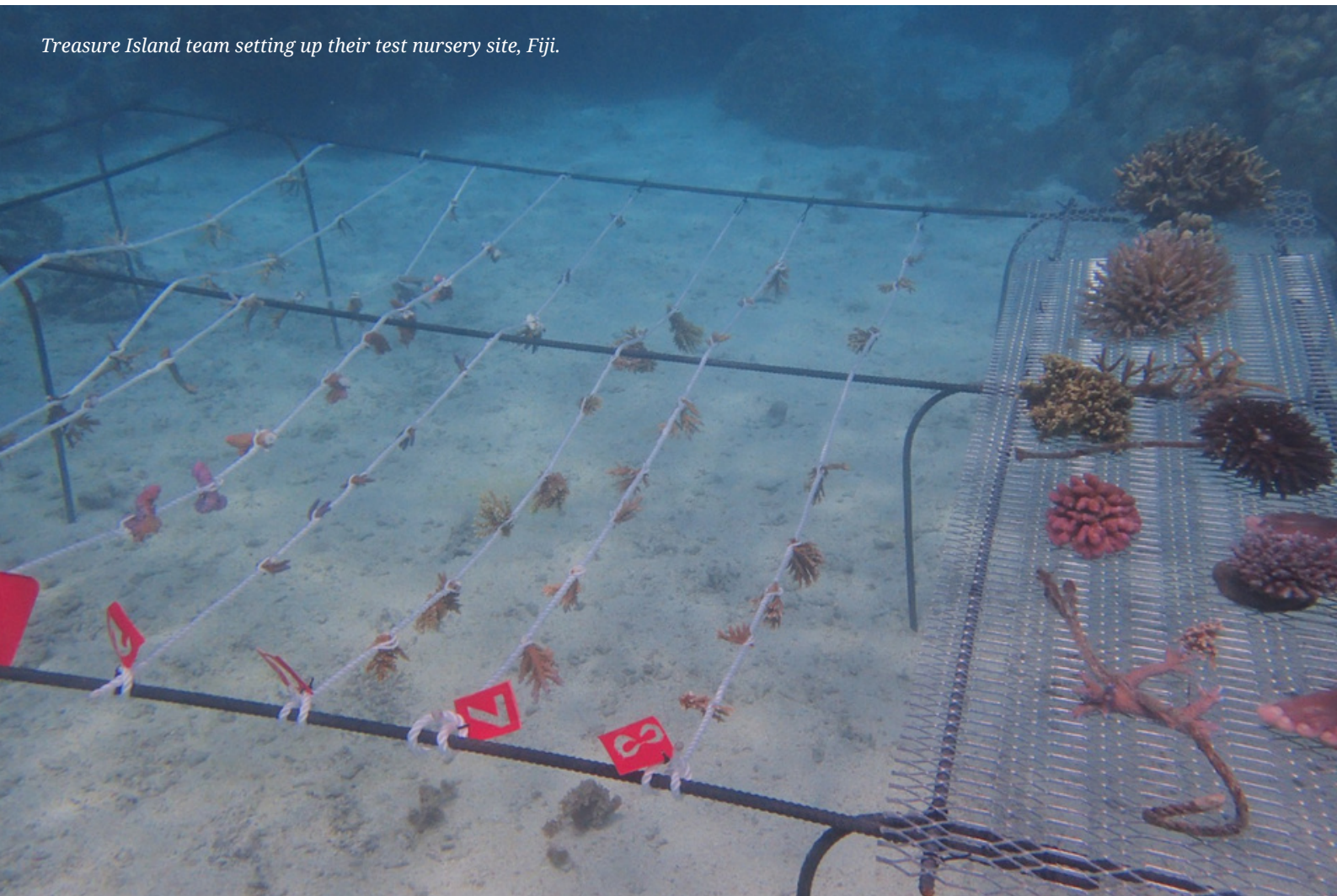
## Pacific Regional

Our Master Farmers in Yule Island have been working hard on our nature-based solution project under DFAT and WWF's Climate Resilient by Nature Program, helping the community set up two new coral nurseries. We are excited to report that we've identified several community members, including strong female representation, to attend coral gardening workshops in Fiji. One young female coral gardener, Susan Aku, has been a standout in the project, leading the work and monitoring activities.

Our partner organization, Corals for Conservation, has also been making strides in Moturiki, Fiji, addressing the impacts of a summer bleaching event and identifying community leader workshop participants.

And that's not all! We're also supporting marine science participants in implementing their test nurseries once temperatures have cooled down. Plus, pre-production activities for our upcoming village chicken training videos have already begun. Mike Worsman from Give Media, who previously produced outstanding coral films in Fiji, will be starting production in PNG this April. Stay tuned for more updates!

*Treasure Island team setting up their test nursery site, Fiji.*



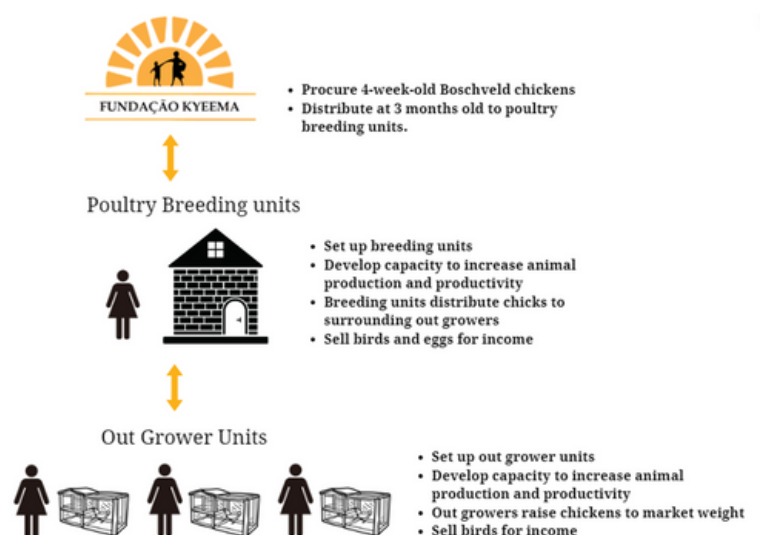


# Promoting Local Chicken Small Business to Mitigate the Impact of COVID-19 on Rural Vulnerable Women

Kyeema's "Promoting local chicken small business to mitigate the impact of COVID-19 on rural vulnerable women" project is making efforts to improve the nutrition, health and livelihoods of rural communities in Mozambique. The pandemic has negatively impacted people's livelihoods due to restrictions on the movement of goods and people, which has caused economic hardship, especially for female-headed households. This project was designed to mitigate these impacts by promoting small-scale poultry production as a means of economic empowerment for vulnerable women.

Small-scale poultry production has significant potential for the rural communities in Mozambique. Women accrue most of the income from poultry, which helps to support their families and invest in their futures. The project model adapted the International Fund for Agricultural Development (IFAD) Cambodia "Semi-intensive rural poultry production model". This model has positive impacts for female beneficiaries, such as providing them with a source of income and economic empowerment, building their skills and knowledge in animal husbandry and business management, and improving food security and nutrition.

The project involved setting up three small poultry breeding units and 30 outgrower units. Each breeding unit develops capacity to increase animal production and productivity, and then distributes chicks to surrounding outgrowers. The outgrowers raise the birds to a larger size, typically with a focus on high-quality feed and management practices. Once the animals reach a certain weight or age, they are sold to local markets or nearby towns. The outgrowers receive training and support from the breeding units and extension officers in animal husbandry, feed management, and market access, among other things.



The project aims to improve food security and nutrition in rural communities. By increasing the availability of high-quality animal products for household consumption and in local markets, it can provide greater access to protein and other essential nutrients, which can improve health outcomes. Also, the model can support local economies and promote sustainable agriculture practices, which can help build resilience in the face of climate change and other challenges.



*Training on poultry feed mixtures based on home-produced feed resources*

One of the challenges faced by the project has been the affordability of high-quality feed, which is crucial for the health and growth of the chickens. To address this, the project has trained the beneficiaries to make their own poultry feed mixtures based on home-produced feed resources or ingredients obtained locally. Additionally, the project has provided training and support in disease prevention and management to address issues related to disease and mortality rates, which can affect the profitability of the outgrowers. Despite these challenges, the project has been successful in achieving positive outcomes, including providing a source of income and economic empowerment for women in rural communities, improving food security and nutrition, supporting local economies, and promoting sustainable agriculture practices, which can help build resilience in the face of COVID-19, climate change and other challenges.



*Mrs Clara crushing egg shells to mix in the poultry feed*

Salma Matavel, a 20-year-old outgrower under the project, lives with her family of 10 people. She received support from the project in the form of 30 chicks with 21 day-old, a starter pack containing feeders, drinkers, chicken feed, and training in poultry production. When the chicks had grown up, Salma began selling chickens and eggs. From the sale of 16 chickens and 116 eggs, she earned around 7000,00 MZN (110 USD). Some of the remaining hens are also hatching chicks. Salma plans to open a small business with the money she earns from the chickens in the future.





*"With the money, in addition to helping with the household expenses, I paid my school fee for this year and bought my books and other school materials without many difficulties as it used to be. I am very grateful for being part of this project."*

*Salma sitting with her new uniform purchased with money from egg and chicken sales.*

The breeding units and outgrowers in Marracuene district have gained technical knowledge in the new poultry-keeping techniques using the semi-intensive poultry production model. The women are selling eggs and chickens and with the money earned they are buying poultry feed, maize bran, vaccines and dewormers when they need them. They are also eating eggs and chicken, which contributes to improving their household income and nutrition. Livestock and extension technicians also attended the trainings and accompanied the team from Kyeema during the project implementation so that they will be in a position to support the farmers on an ongoing basis to ensure sustainability.



*Mrs. Lucia with her new chicken house*

In conclusion, the "Promoting local chicken small business to mitigate the impact of COVID-19 on rural vulnerable women" project has provided a powerful tool for promoting improving nutrition, health and livelihoods through economic empowerment, food security, and sustainable agriculture, with particular benefits for the female participants.

The encouraging outcomes of the project have led to the establishment of our new ANCP program in Mozambique, based on the expansion of these activities. We are thrilled to continue our efforts under the support of the Australian government. Stay tuned for more updates on this program!

# Resilient Communities

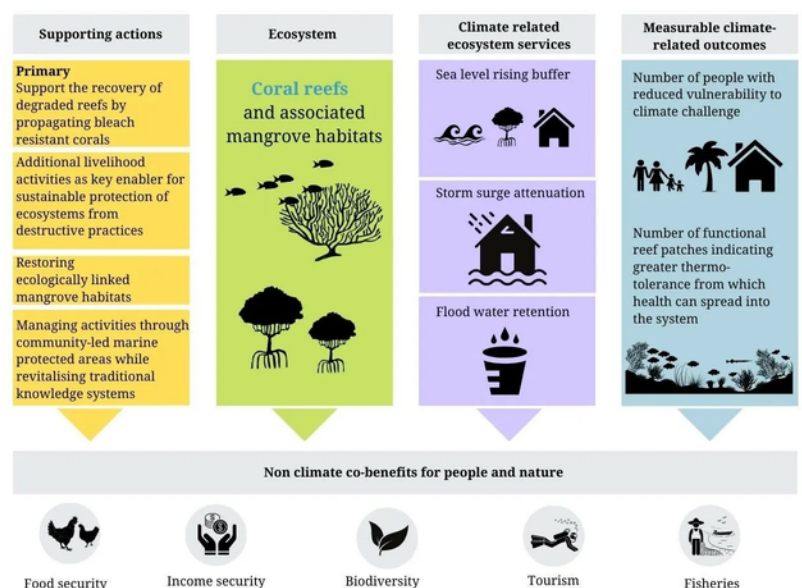
*Supporting local partners to address locally identified challenges*

## Reflecting on a community-led nature based-solution to support survival of coral reefs in the face of climate change.

In June 2022 Kyeema embarked upon Australia-Pacific Nature-based Solutions Challenge with partners Corals for Conservation and Just World Partnerships. This multi-million dollar challenge fund supports Australian NGO Cooperation Program accredited organisations, like Kyeema, and their partners in the Pacific to pilot and expand promising and emerging nature-based solutions.

We are supporting young Indigenous scientists, community leaders, and frontline Ministry staff from Pacific Island countries, to help save compromised reef ecosystems. Healthy reefs will reduce the vulnerability of coastal communities to climate-related shocks like marine heat waves, rising sea levels, storm surges and coastal erosion. Indigenous scientists from Fiji, PNG Samoa are tasked with identifying bleaching resistant corals, and cultivating them in test nurseries for reintroduction into local reef out planting sites in the coming years. In addition community leaders in Yule Island (PNG) and Motoriki Island (Fiji) will support establishment of community-led coral reef restoration sites, alongside mangrove restoration and livelihoods activities such as village chicken keeping. The establishment of low input village birds serve as an alternative protein and income source in communities whilst fish stocks recover in restoration sites.

In the first six months of the project a total of 215 people representing 7 communities have been directly engaged in the project across PNG, Fiji and Samoa. This has included training for 19 marine scientists (12 women and 6 youth) in coral reef restoration. Support, guidance, and seed funding has been released to groups of these trained coral reef champions to establish six test nursery sites (2 Fiji, 2 Samoa, 2 PNG) that are planned to establish evidence for the thermotolerance of genotypes and species from inshore hot pocket reefs.





These efforts are incredibly timely given the extant threat from soaring water temperatures over the summer of 2022-23; not ideal conditions for re-locating corals and setting up experiments to test their thermal tolerance. Despite this, three test nursery sites have been established (2 in Fiji and 1 in PNG). The remainder of the sites are planned for set up in the forthcoming quarter once average summer sea temperatures have dropped below 29 degrees.

The key to sustainability of reefs is building community and Customary Owner understanding of their importance and principles for care. Baseline community consultations have been undertaken with 56 men, women and youth across 4 villages in Yule Island and Motoriki Island. Communities have agreed on the key activities for the NbS to go forward including coral reef restoration, mangrove planting and improved village chicken keeping and Motoriki communities have planned for two Marine Protected Areas to be established. A Master village chicken farm has been set up in Yule Island and 6 community leaders (5 women and 3 youth) have been chosen to attend the community training planned for May 2023 in Fiji. A coral reef restoration site (with two nursery patches) has been established in Yule Island also, with the LMMA around it yet to be officially agreed upon. Support for mangrove restoration activities for Yule Island have also been initiated with the existing Women in Mangrove Management (WIMMA) group in Poukama. In the hope of scaling this citizen science approach for Pacific community coral reefs, we have produced a four-part training video series on 'Coral Reef Restoration for Climate Action' that will be launched in 2023. We are interested in reaching out to personnel and networks from Vanuatu, Tuvalu and Kiribati and any other Pacific Island Country members interested in learning about implementing this work.



*Arovudi team and helpers setting up their test nursery site, Fiji.*



*Treasure Island team setting up their test nursery site, Fiji.*

Climate Resilient by Nature (CRxN) is an Australian Government initiative in partnership with WWF-Australia, advancing equitable nature-based solutions to climate change in the Indo-Pacific. CRxN supports projects that work with communities to restore and protect critical ecosystems, build sustainable livelihoods, and increase resilience to climate shocks.





## Mangroves and climate change: Building resilient communities on the frontlines of climate change

Kyeema work in Papua New Guinea (PNG) has centred on sustainable protein production, alternative livelihoods, and helping build resilient marine environments. Happily this is seeing more and more interest and work in conservation and restoration of mangrove forests. Mangrove restoration involves re-establishing mangrove forests in areas where they have been degraded or lost. The benefits of restoring mangroves are well documented and vital for coastal community resilience:

- Biodiversity conservation: Mangroves provide habitat for a variety of plant and animal species, many of which are endemic to the region.
- Climate change mitigation: Mangroves absorb large amounts of carbon dioxide, making them an important tool in the fight against climate change.
- Coastal protection: Mangroves protect coastlines from erosion, storm surges, and other disasters and environmental impacts.
- Livelihoods: Mangroves provide livelihoods for local communities, who rely on them for food, fuel, and building materials. They are important breeding grounds for fisheries serving an important part of Pacific coastal diets and culture.

The key as we see it to effective and sustainable mangrove restoration is having the genuine community-led engagement. This engagement provides the opportunity to build awareness, provide a platform for decision-making processes and foster ownership and the community participation that ensures recognition of the importance of the mangroves far beyond a convenient source of building materials or firewood. This is crucial in promoting the sustainable use of mangrove resources. By working together, communities can find mutually beneficial solutions that balance the needs of local livelihoods with the long-term health of the mangrove forests.





*Mangrove seedlings in the Tubusereia nursery.*

In late 2021, one of Kyeema's Master Farmers – Koivi Egu established a mangrove nursery at his farm in Tubusereia. Using a direct-planting method, Koivi is now out-planting into a nearby degraded area and is experimenting with various techniques as he cares for over 1000 seedlings and with the support of Kyeema's DFAT funded Australian NGO Cooperation Program project . Koivi attended a mangrove planting event in Central Province hosted by the Nature Conservancy and is now skilled up and committed to help support this initiative and work towards the exciting goals for mangrove restoration in PNG.

Another great example of this type of community-led initiative is the Women in Mangrove Management (WIMA) in Poukama, Central Province. These women have been planting mangroves around Hall Sound Bay since 2014. Now with over 30 members and more than 20,000 mangroves planted, WIMA have become a critical rehabilitation and conservation hub for Poukama and Yule Island.

Frontline communities like Poukama and Tubusereia are taking the lead and helping their people change how they think about mangroves, but like many coastal communities in PNG, they are bearing the brunt of climate change.



*WIMA members, Marie Aisi and Marie Mamei, and their mangrove restoration site at Poukama*



On Christmas Day 2022, a massive king tide demolished a house in Poukama and destroyed WIMA's mangrove nursery washing away nearly 2000 seedlings and years of dedicated work. This was a great loss for the significant community-based and female-led restoration initiative. We are assisting WIMA to build back better an improved mangrove nursery and continue their crucial work and benefit more communities in Central Province. If we can secure more funding we aim to expand the operations and reach of WIMA and make them a leading example of the capability of community groups along the coast.



*WIMA mangrove nursery in 2022 before king tide, Right: Impacts of the king tides before it was submerged.*

Kyeema is committed to supporting climate impacted communities and building the resilience of those taking the lead in restoration activities in PNG.

Why not help us support WIMA in Poukama to continue their efforts and rebuild their mangrove nursery? This work will leverage the benefits of a wider 'nature-based solutions to climate change' project in Yule Island supported through the Climate Resilient by Nature Program of DFAT and World Wildlife Fund Australia.

Simply go to our Donate page or contact us at [kyeema@kyeemafoundation.org](mailto:kyeema@kyeemafoundation.org). Together, we can make a difference and build a more resilient future for the communities and ecosystems that depend on mangroves.





## Challenge Fund 2022

After a rigorous application and selection process, we are pleased to announce the new projects selected for the 2022 Challenge Funds themes. Each project presents an innovative solution to the global challenges posed in last year's Challenge Fund round.

**Under the 'Measuring the Value of Nature' theme, we have three projects that aim to develop tools and programs to measure and manage nature-based solution initiatives.**

FarmTree will pilot and test their FarmTree Tool in the Ethiopian coffee system, integrating functionality for carbon and biodiversity credits and certification. This will improve agroforestry planning and management for up to 12,000 coffee farming households.

Space4Good will develop the 'Carbometrica' Measurement, Reporting & Verification (MRV) tool for remote-sensing biomass and carbon assessment of agroforestry and afforestation projects. Funding will enable the development of a new AI and machine learning algorithm for the South East Asia ecoregion. This will increase the rigor and reduce costs of calculating and verifying carbon credits, accelerate NBS carbon project development, and has high potential for replication in additional ecoregions such as Africa and Latin America.

Treeconomy will develop an AI machine learning tool for tree detection and measurement for mixed UK woodlands. This funding will be used for technical team labor costs, remote sensing data, and ground-truth data capture. This will reduce costs, increase speed and accuracy for forest surveys and carbon calculations, enhance rigor and trust in the impact of reforestation projects, reduce risk, reduce barriers of entry for rural landowners and farmers, and have wide potential applicability globally.

**Under the 'Jobs for Refugees' theme, three projects have been selected aimed at creating more inclusive solutions for refugees and internally displaced people to find sustainable employment.**

Incluyeme.com plans to partner with the National Technological University of Argentina, Amazon Web Services (AWS), and 600 employers to train and place Latin American refugees in well-paying jobs. The project aims to build local capacity and relationships across the university, AWS, private sector, and refugee-serving groups to train and place marginalized populations in the growing digital fields. Finance will be used to outreach to refugees, provide training and student support services, and connect graduates with employment opportunities. The success of this project in the cloud computing industry makes it highly replicable globally.

CONCAT Tech will focus on training and placing female Palestinian refugees in the tech industry. The project will build digital and soft skills of female Palestinian refugees, promote their digital skills, and increase awareness of CONCAT digital services for companies seeking to support marginalized populations through their web development spending. The project showcases a scalable social enterprise model that can reduce barriers to women's representation in the tech industry. It has strong replication potential in the digital industry, which has two million open development roles.

Lira-Magoya Investments in Uganda will provide training, employment, and sales opportunities in cassava farming and processing for refugees from South Sudan. The project will use the finance to provide training in cassava production and processing, distribute seeds to outgrowers, and expand cassava processing capacity. The project aims to prove the broad impact of a cassava processing facility to support a network of outgrowers and employ refugees in agro-processing. The project will adapt to climate change by demonstrating the viability of high-yield, drought-resistant varieties and developing markets for tractor tilling services and seed sales. Cassava outgrowers will improve nutritional outcomes as farm families consume cassava they grow, and increase farm incomes by selling a portion of production.

Overall, these six projects offer promising and creative solutions to global challenges. We will have more information on each of the projects shortly!





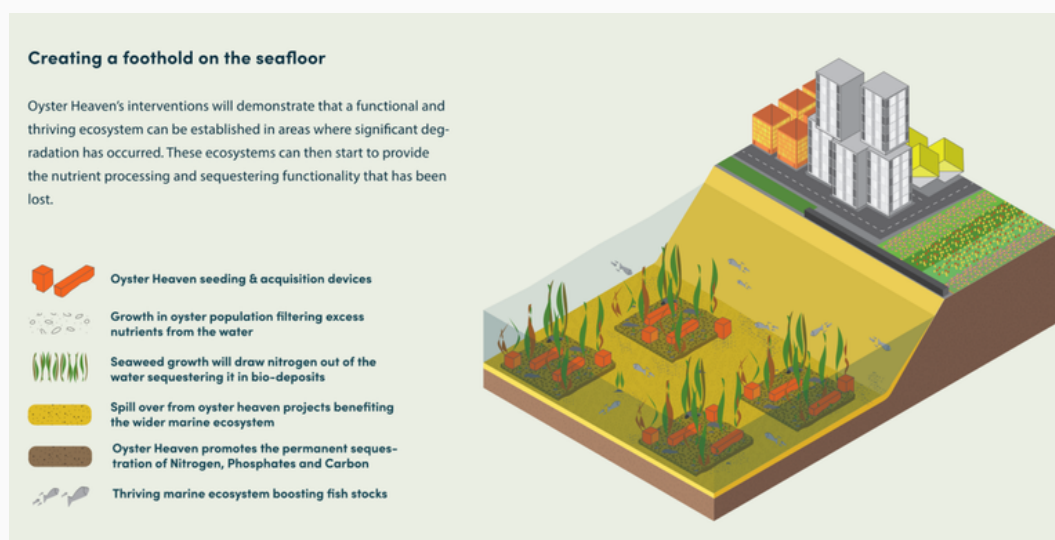
## Oyster Heaven: Biofilm innovation for oyster reef restoration

Over the past few decades, the use of chemical fertilizers has led to the accumulation of nitrogen and phosphorus in coastal ecosystems. This has resulted in mass phytoplankton production and microalgae blooms that damage the structure and function of these ecosystems, making life difficult for many marine life and ecosystems.

Oyster reefs removes nitrogen naturally from the water acting as natural filters in the ecosystem. Unfortunately, due to overfishing and habitat degradation, native oysters are close to extinction, impacting the environment and the local fishing industry.

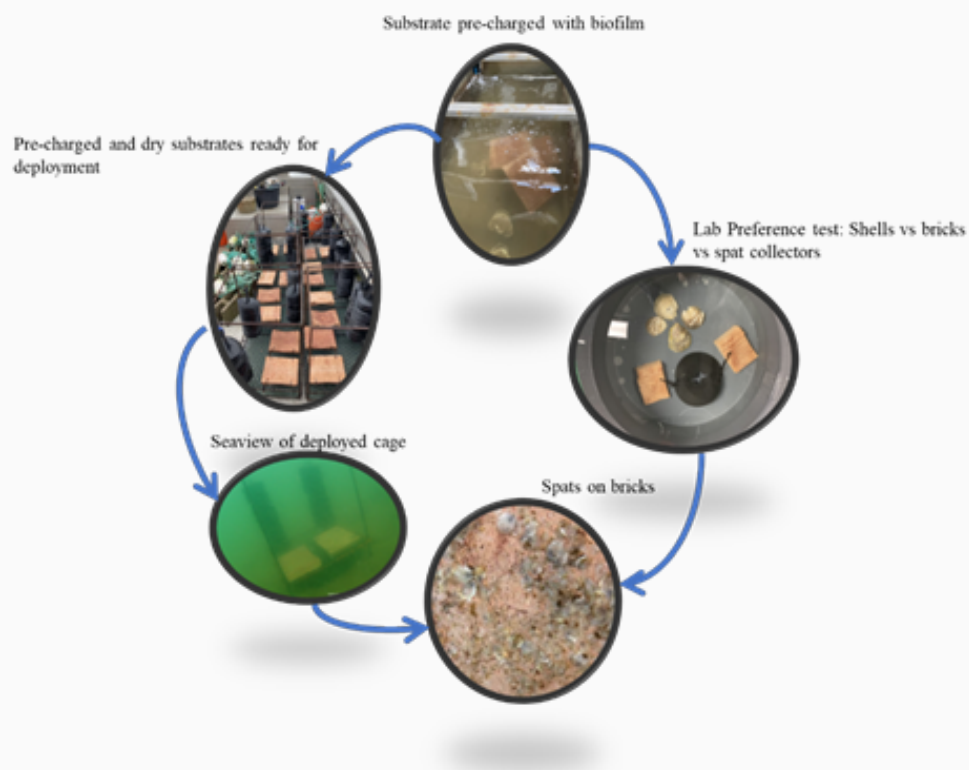
Oyster Heaven have an innovative approach to oyster reef restoration that is hoped will change the game for our oceans and marine ecosystems around the world.

Oyster Heaven, a marine restoration group received funding through the 2021 Valuing Nature Challenge Fund. This initiative asked organizations to offer creative solutions to making nature protection a more alluring economic pursuit than destruction. Oyster Heaven's proposal aims to rejuvenate lost oyster reefs in the North Sea by synthetically recreating the biofilm and attractants produced by oyster shells, resulting in improved settlement rates on reef structures, using a sustainable and natural protocol.



Funding helped to support the implementation of a biofilm study. It is believed that the microorganisms in the biofilm emit cues that allow larvae to locate the settlement substrate. By coating the Mother Reef (a low carbon, biodegradable hard substrate specific to oysters developed by Oyster Heaven) with the right biofilm, the organization hopes to facilitate oyster larvae settlement and allow for large-scale restoration.

In the first stage of their research, Oyster Heaven conducted an experiment to investigate the transfer of native biofilm on the substrate. The results confirmed the transfer of biofilm on the surface of the bricks within 30 minutes of exposure. The biofilm was analyzed, and bacteria from the order Chloroplast were detected, whose role in nitrogen and carbon cycling has been widely documented.



In the second stage, Oyster Heaven worked with the National Institute of Aquatic Resources in Nykøbing Mors, Denmark (DTU Aqua) to study the efficiency of the native biofilm in larval settlement. Unexpected changes in temperatures and tides affected the field experiment, so the organization carried out an experiment at the hatchery under controlled laboratory conditions. The results showed that healthy spats settled on both substrates, confirming that larvae can settle on oyster reefs. These ‘spats on reefs’ were then deployed in the sea with mother reefs and are currently being monitored.

Valuable information and key learnings have been generated from this field study, particularly in verifying that oyster larvae can settle on the Mother Reefs, which will be crucial for future biofilm experiments and pilot projects. However, there are significant challenges that need to be addressed, such as the reliance on environmental conditions for success and the limitation of biofilm formation due to the settlement of other marine species.

After ten months of research and a comprehensive review of previous results, Oyster Heaven is compiling the characterizations of the microflora associated with existing oyster reefs into a manuscript to be submitted for publication by the end of December 2023. 2023 will see studies on the impact of oyster reefs on the nitrogen and carbon cycles maximization of settlement on the Mother reefs.