



*Power to the people*

**SABAH RURAL ELECTRIFICATION RENEWABLE ENERGY INITIATIVE**





# Overview

This publication shares conversations, reflections and highlights following the Forever Sabah Institute (FSI) Valley Immersion (VI) in partnership with the Kampung Dagat Community.

In this Valley Immersion, we travel to Kampung Dagat, Lahad Datu, to meet a community lighting their own future with renewable energy – witnessing their potential to lead a just energy transition. Here, we learn through local livelihood activities and engage in dialogue, exploring how communities play an active role in co-governing territories of life whilst paving the way for regenerative solutions and low carbon livelihoods. Meanwhile, we share climate study findings to ask how climate change will impact a rich and complex seascape with the hope of co-generating possibilities for adaptation measures.

We journeyed 12-hours to the riverside village that is nestled at the edge of Tabin Wildlife Reserve flanked by jungle and wildlife. The programme began with an introduction to the village and the Sabah Renewable Energy Rural Electrification Initiative (Sabah RE2), followed by warm hospitality by *keluarga angkat* (host families). Kg Dagat is foremost a

working and living model of how renewable energy enables rural communities in navigating climate change and complementing traditional, indigenous life ways. Women play a central role in this transition to renewables, leading initiatives such as solar-powered ice production and artisanal food products, while youth are nurturing aspirations for upskilling and vocational training.

We discovered Kg Dagat to be a community that is confronting climate change in visible and lived ways as they face rising waters, heat extremes, and biodiversity loss. Meanwhile, reduced fish catch threatens both tradition and livelihood. Dialogue sessions during the visit helped surface both anxieties and aspirations, affirming the community's readiness to collaborate on sustainable, locally rooted solutions. We found a clear demonstration of resilience and adaptability: proposing riparian planting, shifting income strategies, and embracing and adapting to renewable energy. Amid these shifts, we learned of the spirit of unity in community as we witnessed commitment to safeguard cultural identity and the passing on of ancestral values to the younger generation.

**What are Valley Immersions?** Valley Immersions take us across Sabah and deep into the lives of our community partners and the team members who work with them. It is part of FSI's mission to support the knowing-doing-sharing nexus of the Forever Sabah Ecology.





# PROGRAMME DESIGN

## Day 1 – 25 April

- Travel & Arrival – 12 hours via Bus & Community Cars
- Welcoming & Intention Setting
- Session #1 Getting to Know Kg Dagat & Sabah Renewable Energy Rural Electrification Initiative (Sabah RE2)
- Dinner with *Keluarga Angkat*

## Day 2 – 26 April

- Breakfast
- Session #2 Co-creating Guidelines, Safety Briefing & *Pantang Larang*
- Activity #1 Making Seafood Products with Dagat Women
- Lunch
- Activity #2 Ulu Tabin Water Collection & Ice Making
- Dinner

## Day 2 – 27 April

- Breakfast
- Session #2 Co-creating Guidelines, Safety Briefing & *Pantang Larang*
- Activity #1 Making Seafood Products with Dagat Women
- Lunch
- Activity #2 Ulu Tabin Water Collection & Ice Making
- Dinner



# GETTING TO KNOW KAMPUNG DAGAT WITHIN THE SABAH RENEWABLE ENERGY RURAL ELECTRIFICATION ROADMAP (SABAH RE2)

In early 2021, a Consortium of five civil society organizations long embedded in low-carbon energy access and community development issues (TONIBUNG, PACOS Trust, Green Empowerment, Energy Action Partners and Forever Sabah) came together to drive development of the Sabah Renewable Energy Rural Electrification Roadmap (Sabah RE2 Roadmap) with funds from UK-PACT. This initiative partnered with key Sabah Government agencies and the state utility (SESU) to map and survey the un-electrified villages in Sabah and develop a systematic approach to electrifying 200 communities (half the total need) by 2030 through community-managed renewable energy mini-grids.

Kampung Dagat is one of the villages identified through Sabah RE2 as being too remote to be connected to main transmission lines. As a village, its main source of electricity are diesel generators, for which residents make a day's travel through unpaved logging roads to buy fuel in Lahad Datu. Throughout the Valley Immersion, we delved deeper into Kampung Dagat's struggles, challenges and aspirations around energy as a community striving to keep pace with the modern world, all of which are layered with compounding effects of climate change.







## JUST TRANSITION & ENERGY ACCESS

The Malaysian government recognizes that a just energy transition requires universal energy access. Its 12th Malaysia Plan (12MP) that guides government priorities highlights the need to invest in energy infrastructure in its least developed states, Sabah and Sarawak. The Project's focus area, Sabah, is home to Malaysia's 8 out of 10 poorest districts and 72% of its unelectrified rural households. Sabah's state government recognizes that the energy-climate crisis is a trilemma that requires progress on increasing energy security; accessibility and affordability; and Sustainability. Rural electrification is equally a priority, but has been historically focused on enhancing the grid, expanding its coverage and increasing installed capacity. With its grid electricity dependent on fossil fuel (82%), the state risks treading a high-carbon development path counter to Malaysia's Paris Agreement commitment.

Community-based renewable energy mini grids are a climate-positive alternative to rural electrification, of which Kampung Dagat serves as a living example. Renewable energy complements traditional livelihoods such as fisheries, alongside boosting local economies spearheaded by women and diversifying income for households and individuals.



# SOCIO-ECONOMIC DEVELOPMENT POWERED BY RENEWABLE ENERGY

In August 2023, Kampung Dagat established its first women-led committee, Pertubuhan Ekonomi Sosial Wanita (PSE) or the Women's Socio-Economic Association, to strengthen women's livelihoods and leadership in the village. This milestone coincided with the arrival of solar power infrastructure, including the installation of solar panels, battery storage, and a community-use refrigerator marking a pivotal shift in the village's ability to support economic activity. Today, the PSE group comprises 17 women who manage the *Pusat Sosioekonomi* (Socioeconomic Activities Hub) and run the village's first locally owned ice production initiative. For these women, solar energy is more than just a power source – it generates a pathway to improve quality of life, raise income, uplift livelihoods and lead community development.

Fishing is a way of life in Kampung Dagat, with daily seafood catches forming the

basis of food and income. Yet in the past, lack of access to reliable cold storage led to frequent waste, even with efforts to preserve seafood using purchased ice. Community members would travel up to seven hours to Lahad Datu or Sandakan just to buy ice and other essentials costing them time, fuel, and money. With the introduction of solar-powered refrigeration, however, the PSE women saw an opportunity: to produce and sell ice locally. This solar-enabled solution has since become the group's primary source of income, reducing post-harvest losses, cutting household expenses, and positioning women as key drivers of Kampung Dagat's emerging solar-powered economy.





# WATER COLLECTION & ICE-MAKING ACTIVITY

The process of making ice is a strenuous task because Kg Dagat is still reliant on rainwater for daily needs. The availability of rainwater varies depending on the season, and during the drought and it is harvested just enough to supply a family's household needs including bathing and washing. We followed a few women leaders as they took us by boat to the Ulu Tabin river to show us where and how they collect river water for ice. Recycling used plastic water bottles, each 1.5 litre bottle is filled up with water manually and transported back to Socioeconomic Activities Hub. The bottles are then placed directly into freezers to create "DIY ice packs." However, nature interrupts this process as saltwater intrudes the Ulu Tabin river during the dry season. High salinity in the water makes it difficult for the water to freeze in time to meet demand. On top of that, PSE members have to endure hard labour under peak heat and sun. Ice production becomes slower and the quantity of ice they make decreases during drought.







# IKAN TAUSI PRODUCTION

The PSE women of Kampung Dagat have begun experimenting with producing a range of market-ready, packaged food products as a creative solution to minimise seafood waste and diversify income. Their first product—*ikan tausi*, or fish preserved in salted black beans—is a savoury side dish made by twice-frying small white fish and marinating them in soy sauce, chillies, sugar, salt, and fermented black beans. With its long shelf life, *ikan tausi* is intended to be sold as an artisanal Kampung Dagat product, helping to build economic stability for the women involved.

This venture into food product development reflects the women's growing ambition to upskill in entrepreneurship and technology use. It also highlights their openness to learning from outside the village—for instance, the *ikan tausi* recipe is not a traditional local dish, but one they've adopted through peer exchange. As they develop new products, they're also gaining valuable experience in food hygiene, packaging standards, and compliance which enhances their traditional cooking skills with new knowledge that supports both upskilling and livelihoods.



# CLIMATE CHANGE & IMPACTS ON KAMPUNG DAGAT

Over the past three years, Forever Sabah has been actively engaged in understanding the impacts of climate change on Sabah's diverse landscapes and seascapes. Drawing from a range of downscaled climate projections, the climate team developed a set of impact and extreme climate indices that illuminate the likely effects of climate change on human health, water availability, heat stress, food security, and natural ecosystems across the state. These projections are modelled across multiple scenarios over thirty-year periods: mid-century (2041–2070) and end-century (2071–2100) periods, including the current global trajectory of around ~2.7°C warming, an optimistic scenario (~1.7°C), and a pessimistic scenario (~4.0°C+).

Crucially, a significant part of our climate work involves ground-truthing this data to make sense of scientific projections in relation to the lived realities of

communities across Sabah. While the data paints a sobering picture for the state's future, we remain attentive to the mounting pressures faced by climate-frontliner communities like Kampung Dagat, where shifts in climate directly threaten biodiversity, forests, rivers, and the land they steward and depend on. During our visit, we shared localised climate findings with the community, including projections on heat stress for outdoor workers, changing rainfall patterns, and sea level rise which are issues of particular concern to Dagat's fisherfolk. We used these presentations to open space for dialogue, listening to community reflections on the study and their hopes for the future in a changing climate. We asked: *What are your initial thoughts after hearing about the climate study findings? What do you imagine for the future of Kg Dagat?*

Expectedly, folks are worried, concerned and fearful about climate change yet

cognizant to present weather changes and how its beginning to impact them. Conversations with the community revealed to us that they are experiencing 1) unpredictable rainfall patterns whereby different villages in the area now experience unaligned weather; 2) higher temperatures; 3) an increase in flooding frequency; 4) and a sense that their river is expanding. Extreme weather events like flooding would exacerbate already challenging road conditions and block transport to-and-from the village affecting access to markets and towns. Additionally, they found that traditional forecasting methods (e.g., watching the stars, listening to crow calls, observing insect movement) are less reliable now due to weather and climate changes, impacting the village's connection to culture and adat (customs).







## COMMUNITY ASPIRATIONS & LOOKING TOWARDS THE FUTURE

The climate study findings initially provoked negative reactions like fear, anger, disappointment and prompted questioning around what the community could do to halt or slow down impacts of climate change. However, smaller group discussions yielded hope and aspirations for climate futures. These conversations coalesced around a few key themes, which we've captured as summaries below:

## CLIMATE ANXIETY

Many community members expressed emotional unease and feelings of uncertainty. These included fears around sea level rises which affect the ability to travel further out for fishing activity; an increase in natural disasters like flooding and so on. Some folks also expressed the need to '*sediakan payung sebelum hujan*' (to prepare the umbrella before the rain), which is a Malay idiom to describe preparation in advance which suggests growing awareness around hardship to come, yet a readiness to take action.

The physical environment around the community is changing in visible and damaging ways. Many have noted erosion by the river bank through a sense that "the river has widened." Kg Dagat experienced what they believe to be its worst flooding this year as their roads were submerged under water

for two weeks. Droughts too have felt longer with unbearable heat starting as early as 9am. This has made fisherfolk lessen their working hours so as to arrive at shore by noon. Meanwhile, Kg Dagat's Community Orangutan Ranger Team (CORT) observe environmental shifts through animal behaviour, and communicate concern around the loss of ecosystems as a people living tethered to the river, estuary and jungle. This disrupts the balance between human life and nature, threatening both livelihoods and biodiversity.





## SEEKING ALTERNATIVE LIVELIHOODS

Fishing remains the primary source of livelihood for the community, making the decline in seafood catch a growing concern. Many expressed fear that continued environmental degradation would lead to further income loss. For instance, one resident shared that the number of prawns have declined over the past years, noting how one spot could yield 20-30 kilograms before, but now only yields about 10 kilograms. The availability of fish species has also diminished over time.

This decline has compelled households to seek alternative sources of income, often beyond their traditional roles. Community discussions reflected a clear recognition of the need to shift livelihood strategies, particularly among the youth. Several voiced interest in specialised technical and vocational training being offered within the village,

as a way to diversify skillsets and expand opportunities for sustainable income in the future.



## CULTURAL PRESERVATION AND INTERGENERATIONAL CONTINUITY

The community places deep hope in preserving their *adat* (customs), traditions, and cultural identity from being lost to time. There is a strong aspiration for the younger generation to carry forward the responsibility of caring for the kampung, upholding ancestral knowledge and values. At the same time, they must navigate the pressures of modern life, which often pull youth toward migration to towns and cities. This intergenerational commitment is seen as vital to sustaining their way of life amid the ongoing challenges and changes they face.





# COMMUNITY ADAPTATION AND RESILIENCE

In response to mounting climate challenges, community members expressed a strong willingness to engage in adaptation efforts. They proposed initiatives such as riparian planting, reforestation, and cultivating drought-resistant crops to build ecological resilience. There was also a clear interest in raising local awareness around environmental and climate issues, alongside a growing openness to green solutions such as renewable energy. The community voiced a desire to collaborate more actively with external agencies and stakeholders to co-develop practical and sustainable strategies for long-term resilience.







**FOREVER SABAH  
INSTITUTE**

Metro Town, Unit L-1-7,  
Block L, First Floor, Lot 7,  
Jalan Lintas, 88300 Kota  
Kinabalu, Sabah.

**EMAIL**  
[info@foreversabahinstitute.org](mailto:info@foreversabahinstitute.org)

**WEBSITE**  
[www.foreversabahinstitute.org](http://www.foreversabahinstitute.org)