

The Blue Natural Capital Financing Facility (BNCFF) supports the development of sound, investable Blue Natural Capital (BNC) projects with clear ecosystem service benefits, multiple income streams and appropriate risk-return profiles.

This Blue Prints Series outlines the business models and illustrates the investment structure of a selected number of Nature-based Solution (NbS) projects. See [here](#) for other Blue Prints.

SUSTAINABLE SHRIMP FARMING AND MANGROVE RESTORATION

Blue Print builds upon the Selva Shrimp Farming by Blueyou (Kalimantan, Indonesia)



Problem and practice so far

Shrimp farming has expanded rapidly over the last decades, especially in tropical and subtropical regions. Nowadays it is among the most traded seafood products in the world. Despite its economic benefits, the impact of shrimp farming on ecosystems and biodiversity, in particular, has been devastating. Clearance of mangrove forests for aquaculture ponds and heavy use of chemicals and feed have taken its toll on natural ecosystems that have previously provided a range of services from climate change mitigation and adaptation to fish production and tourism. Without those, communities are less resilient to natural and economic stresses. In cases where severe degradation continues and the ecological balance is destroyed, shrimp ponds are abandoned at a net loss for nature and people.

However, this trade-off between mangrove ecosystems and economic benefit is not the only outcome. Shrimp aquaculture, when properly implemented, presents a resilient income stream in regions with little alternative economic opportunities while harboring and restoring biodiversity. Following a sound Nature-based Solution approach bears not only the potential to protect existing natural ecosystems, but also to partially reverse past ecological damage.

While there is a lot of investment funding available, the requirements of a typical short-term, high return model are unsuited to food production systems where margins are very tight and risk for farmers high. In addition, the complex supply chains in areas with little infrastructure concentrate the power into the hands of unofficial middlemen who then exert unbalanced pressure on prices and supply.

Blue Natural Capital solution

More sustainable shrimp production methods are available but not widespread, notably due to lack of support from existing policies. Despite following a zero-input model (no chemicals nor additional feed) and reforesting lost mangroves to at least 60% of the farming area, shrimp harvest volumes can be increased, become more stable and resilient, and achieve better prices on the rapidly growing sustainability conscious seafood market. Having an experienced private sector partner on board with direct ties to the seafood supply chain and

end buyers enables this shrimp farming model to become financially viable and a sound investment case.

This summary is based on the experiences of a BNCFF supported project. The Blue Print serves as a broader example of how this vision - to integrate sustainable aquaculture with mangrove restoration - can be delivered, outlining both the challenges but also the possibilities.

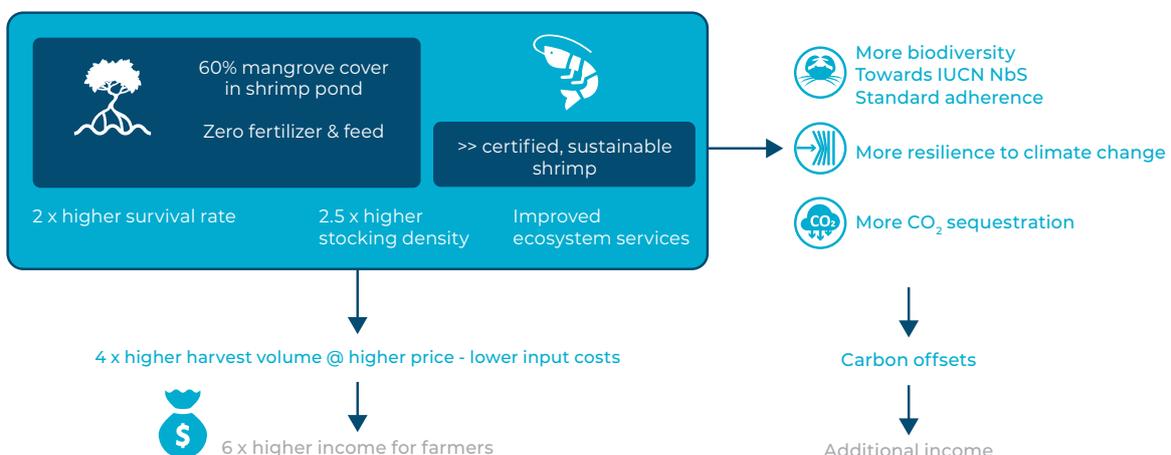
BNC business model

The business model is based on changing existing unsustainable aquaculture practises that have led to damage nature and to in-efficiencies, bearing considerable financial upside. The business model consists of restoring mangroves so that mangroves cover 60% of the shrimp pond area. Shrimp thrive in the natural cover that mangroves provide and develop without relying on external feed or chemical inputs, overall reducing illnesses and input costs. Mangroves are restored and maintained as functional environments providing nutrients and food for shrimps and acting as a carbon sink as well.

Contrary to the more intensive, feed-based shrimp farming systems being used unsustainably

worldwide, the proposed model focuses on the natural environment's capacity to support itself. The mangrove shrimp farming model foresees higher stocking densities and survival rates compared to the status quo of the extensive aquaculture practised in the region, boosting harvest volumes through increased productivity.

In a business-as-usual fed aquaculture system, high upfront costs (mainly through feed but also electricity for aeration etc) are incurred. Farmers usually rely on the harvest to cover those costs. The financial risks are thus directly linked with the success of the harvest.



The rationale behind the sustainably raised shrimps concept is that it eliminates those upfront costs, decreases the financial risks, increases harvest volumes and gives access to a price premium on the market. Since these factors substantially improve farmers earnings, farmers are incentivised to comply with strict business and environmental standards that are based on a zero-input aquaculture approach and require substantial mangrove restoration and protection. A pre-requisite for the business model to work is to follow internationally recognised standards and to receive certification. Certification schemes which are internationally recognised and which demand a good level of pond management as well as a certain amount of mangrove management are for example the German Naturland standard, the EU Organic standard as well as the Aquaculture Stewardship Council (ASC). In a second step, more specific certifications can be obtained such as the Selva Shrimp certification, which adds specific criteria for mangrove integrated aquaculture systems.

Such certification schemes label the products as sustainable on the world seafood market. Conscious seafood consumers, especially in the West, have

created an attractive market for sustainably raised shrimps. Consumers and seafood trading companies alike are willing to pay a premium leading to a two-digit percentage increase in price that farmers may receive for their shrimps. The positive effects from increased harvest yields are however expected to be even larger.

The ecological restoration makes the shrimp farming business more resilient and more productive over longer time periods. The steadier production and promising long-term performance of the naturally restored ponds make these farms more attractive for larger shrimp off-takers in the shrimp processing supply chain. Additionally, the restored mangrove ecosystem provides a home for other aquaculture species, such as mud crab which are prized on the local market, providing further income for farmers.

Further, the mangrove restoration and additional carbon sequestration that the mangroves generate, could lead to the development of a carbon credit scheme, if the project area size is meaningful. Potential carbon sales could further enhance the revenue streams of the project.

Blue impacts and safeguards

The goal is to increase shrimp harvest, improve livelihoods and increase ecosystem resilience through the restoration of ecosystem services provided by the mangroves. Positive impacts include:

- Protecting mangroves and avoiding supplementary feed and chemicals substantially decrease the environmental footprint of shrimp farming. Since in this case mangroves are actually reforested, the project is expected to go beyond impact mitigation and generate substantial net-benefits to nature.
- Bringing ecosystem services back into the region through NbS shrimp farming decreases volatility of harvest cycles (for example from diseases or carrying capacity related to water quality) and decreases the economic risk of communities.
- The minimum 60 % mangrove cover provide for a cost efficient and effective protection against natural hazards including the negative impacts of climate change.
- A more resilient shrimp farming industry provides stable and attractive income opportunities for marginalised communities. While farming itself is male dominated, seafood processing is largely done by women. In addition, resilient shrimp farms offer protection in times of crisis impacting food availability.



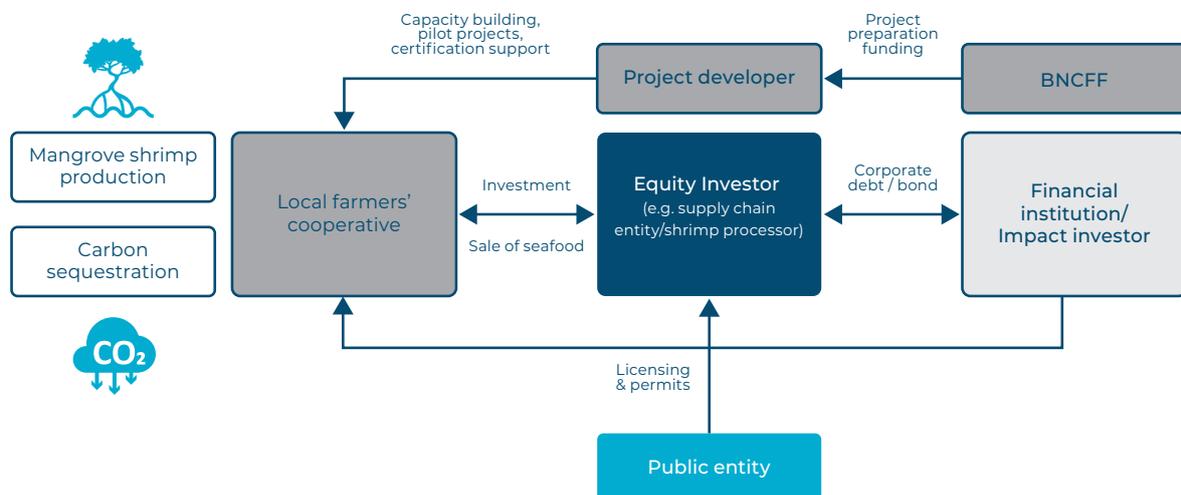
Blue stakeholder roles and needs

- Project developer:** One or more established private sector partners experienced in managing seafood supply chains. Potentially a combination of local sourcing and processing company with international seafood trading company offering direct sales channels to a sustainable customer base. There is a growing interest of the shrimp farming sector to secure a stable supply of sustainably raised shrimps demanded by consumers.
- Contributors:** Local shrimp farmers and their communities, organised into well managed cooperatives or farmer associations in order to be able to attract investors.
- Public entity:** Licensing and permits.
- Interested investor:** Food companies making strategic investments (i.e. vertical integration) could be potential investors. The shrimp farming industry has been characterised by high volatility, prone to natural disasters and diseases with the potential to wipe out shrimp harvest cycles. Investors therefore take a high and at the same time hard to quantify financial risk and are looking for more secure and sustainable production sites.
- Mangrove restoration experts and a local organisation** to train the farmers and the communities in sustainable shrimp farming as well as monitoring and impact evaluation.

Blue investment structure

Starting this new business model often requires grant support to cover costs for capacity building and introducing the model to farmers in order to onboard them for the project. Grant support may also be needed to cover initial upfront costs for reforestation expertise and hydrological works feasibility assessments. Grant and concessional funding will be needed to set up a demonstration project and to cover certification costs for the pilot project. Over time, the finance structure evolves

and grants pave the way for for-profit investments to fund the scale up. It is important to note that investments will have to be channelled through a well-managed cooperative/association rather than at the individual farmer level, so such a structure will need to be established early if not in existence. The organisation of farmers into cooperatives / associations enables them to collectively acquire more power in the shrimp value chain.



The majority of upfront investments are required for acquiring shrimp ponds to demonstrate potential improvements, for hydrological works and mangrove reforestation on the actual shrimp ponds as well as to potentially increase the efficiency of the cold supply chain and capacity of the seafood processing company. This project scaling should be predominantly financed by for-profit capital. This can be either a strategic investor that builds up its sustainable seafood supply chain or a portfolio investor that invests in either a newly created vehicle owned by a company in that sector or existing

companies in the supply chain (for example the local sea food processing company). It can also be considered to raise a green (blue) bond to ring-fence mangrove reforestation and to partially use carbon credits for servicing that debt.

The active reforestation of lost mangroves and the protection of existing mangrove forests bear the potential to sell carbon credits. Sometimes carbon buyers are willing to provide upfront payments for future deliveries acting in a way as an investor or financier.

Blue scalability and replicability

Once a pilot project is completed and farmers at the pilot site are integrated through a cooperative/ association into already working supply chains, the case is made for expansion. By then local farmers throughout the region are aware of the benefits and can more easily be won over and certification just needs to be extended to cover new participants. With the help of the BNCF, work on a pilot site in Indonesia, which is the country with the highest area

loss of mangroves worldwide¹, has already started and the business is expected to be ready for scale-up and to raise for-profit capital in 2023. The model is replicable in most regions in the world where under-performing extensive aquaculture is in place and there is potential for mangroves to be reforested. The model is not suitable for areas with pristine mangrove forests where part of the mangroves would be cleared for shrimp ponds.

Practical tips

To start this business model from scratch in a new area requires a pilot site with a longer concession and demands lead time. Farmers need to voluntarily buy into this farming approach and have to be trained. In addition, mangroves have to be planted

and hydrological work carried out to improve water flow in existing ponds. Finally, certifications like ASC, EU Organic, Naturland or Selva Shrimp have to be obtained. Those early engagements take around two to three years and require grant assistance.

To learn more about this BNCF supported project in Indonesia:
<https://bluenaturalcapital.org/campaigns/selva-shrimp-kalimantan/>
<https://www.blueyou.com/>



¹ [Hamilton, 2016](#)

Since its launch in 2018, the BNCFF has become a global brand name in Ocean Impact Finance. After screening over a hundred proposals, it is presently supporting 8 blue Nature-based Solutions pioneer projects with grant funding.

<https://bluenaturalcapital.org/supported-projects/>

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