# CAPACITY BUILDING FOR MSMES WITHIN MARICULTURE VALUE CHAIN AT THE KENYAN COAST.

## GREEN GROWTH IN THE BLUE ECONOMY:

## INTEGRATING AQUACULTURE AND THE ENVIRONMENT.

Pamoja for Transformation
Building Peace & Development Opportunities

# INTRODUCTION.

Green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies.

The global challenge has been to expand economic opportunities for all in the context of a growing global population and address environmental pressures that if left unaddressed, could undermine our ability to seize these opportunities. Green growth is where these two challenges meet and it is about exploiting the opportunities to realize the two together.

Kenya's demand for fish is equally increasing and this trend is expected to continue due to population growth and increasing wealth as well as a growing preference for healthy foods. Given the natural limits to capture fisheries production, it is clear that aquaculture will have to meet most of the future increase in demand for fish. Almost everywhere people are concerned about the sustainability of fishing and in many places this is for a good reason.

Fish farming has been geared purely towards production with little thought towards its ecological impact. It is because of its adverse impact to the overall marine environment that priority is now given to the aquaculture development in light of green growth, which attaches importance to both environment protection and high productivity.

### Systematic and inclusive approach to green growth

- *Preparing the way for change*
- *Removing barriers to reform*
- *Establishing a new policy set*
- *Measuring results and taking stock.*

### Green growth practices help

- Improve energy and raw materials efficiency
- Limit greenhouse gas emissions
- Minimize waste and pollution
- Protect and restore ecosystems
- Support adaptation to the effects of climate change

## Principles of green growth

- The well-being principle, a green economy enables all people to create and enjoy prosperity.
- The justice principle, the green economy promotes equity within and between generations.
- The planetary boundary principle, the green economy safeguards, restores and invests in nature.
- The efficiency and sufficiency principle, the green economy is geared to support sustainable consumption and production.
- The good governance principle, the green economy is guided by integrated, accountable and resilient institutions.

# GREEN-IN-BLUE APPROACHES

**Restoration of the wetlands and conservation of vegetated habitats are highly effective at sequestering carbon and forming a habitat for wild fish. This would open up economic opportunities in areas where the creation of such water bodies may have resulted in the loss of other livelihoods.Reducing fishing and increasing the use of non-destructive fishing techniques will reduce the negative impacts that fishing has on biodiversity while lowering greenhouse gas emissions and boosting economic growth, food security and poverty reduction.**

The practice of aquaponics promotes a symbiotic relationship between plants and fish and presents an economic opportunity and a reliable food source in areas where aquaculture and soil-based agriculture are challenging. It is an easily adaptable system to provide fish protein, produce and profits to families and small communities. The fish produce waste including ammonia ($NH_3$), which bacteria convert into nitrate, a nutrient for plants. The plants uptake the nitrate, a nutrient for plants, and other nutrients from the water, purifying it before it returns to the fish tank.

For optimal fish production and reduced fish feed costs, the farmer should use environmentally-friendly fish feeds such as natural feed (e.g. snails, algae and wastes from fish) or supplementary feed (agricultural by-products like wheat/maize germ/cow pea pods/corn-based feeds) that are efficient, economically viable, sustainable and do not affect the marine environment in any way. Fish feeds can also be recycled from family leftovers meals e.g. bread, rice and also greens from vegetable gardens which is economical and cost-efficient.

The re-afforestation of mangrove forests in degraded areas reduces coastal flooding and are efficient natural carbon sinks, protects the water quality and wildlife species as well as protects young fish from predators, provide nursery grounds for fish, a food source for tree-climbing crabs and a nectar source for honeybees, serves as a nesting area and stabilizes the coastline. Permaculture can also be incorporated to reduce carbon footprints, to reduce food and fertilizer costs.

*Seaweed farming contributes to climate change mitigation and adaptation by purifying surrounding water, reducing coastal flooding and maintaining ecosystem health. Naturally, seaweed acts as a carbon dioxide sink by trapping atmospheric carbon dioxide and carbon that maybe buried in sediments or exported to the deep sea and converts it to carbohydrates using sunlight. It is also used as fertilizer in improving soil quality and as a cattle feed. They also support high diversity of fish and provide a place where fish can hide, breed and feed.*

*The supply of organic manure in fish farming through the integration of poultry farming reduces the cost of production and increases yield productivity.*

*Improved waste management in fish handling, processing and transportation, green technology such as use of low impact, fuel efficient fishing methods, innovative multi-trophic aquaculture production systems using environmentally friendly feeds, reduced energy and greener refrigeration technologies will reduce the impact of aquaculture on marine ecosystems.*

*The coconut palm tree that is grown by the fish farmers along the coastal region produces nut throughout the year when climatic conditions are favorable and is one of the most important food security crops. It is also practically used by farmers to increase diet flavor (aroma) in fish feed and thus to serve as an attractant to enhance feed intake. In addition, coconut oil is also used by the fish mongers (mama karanga) to deep fry fish due to its neutral taste.*

Practice of bee keeping by the fish farmers within the mangrove ecosystem has an impact on climate change mitigation and poverty alleviation. The green growth aspect in bee keeping seen in the maintenance of biodiversity and pollination of crops (agricultural and horticultural plants). Crops pollinated by bees have higher yields and better quality, often at no extra cost for the farmer, rather crop seed yield increment. Beekeeping is an environmentally friendly and non-farm business activity that has immense contribution to the economy of segments of the society and to a national economy.

## CONCLUSION

Green growth tools and indicators can help expand economic growth, improve livelihoods and create jobs for youth and women through sustainable use of natural resources, efficiencies in the use of energy and valuation of ecosystem services.