



IMPROVED NUTRITION SECURITY IN KENYA THROUGH INCREASED ACCESS TO AND CONSUMPTION OF COASTAL MARINE FISH (SECUREFISH)

In Kenya, 47% of the population live below the poverty line and 26% of children under five years old have stunted growth, an indication of persistent and serious nutrition insecurity. Fisheries are chronically overexploited, and this can be seen in the four-fold decrease in catch for coastal fisheries since the 1980s. Nationally representative data indicate low dietary diversity in vulnerable groups, and only a small fraction of young children (20.9%) reported to have consumed any fish, meat or poultry (Kenya DHS, 2014). Some of the most vulnerable people to malnutrition and nutrient deficiencies are those along Kenyan coastlines and include infants and young children, pregnant and lactating women, and school-aged children living in poor households.



Community meeting discussing nutritional benefits of fish for young children. *Melissa Chapnick/WUSTL*

Small-scale fishing has large-scale implications because it can ensure well-being by providing nutrient-rich foods in the household diet. The SecureFish project generated evidence that will inform other research initiatives to improve human welfare and nutrition using eco-sensitive approaches to fish foods. The overall goal of this project was to improve nutrition among vulnerable populations in Kenya through increased access and consumption of sustainable fish foods. Short-term aims were to

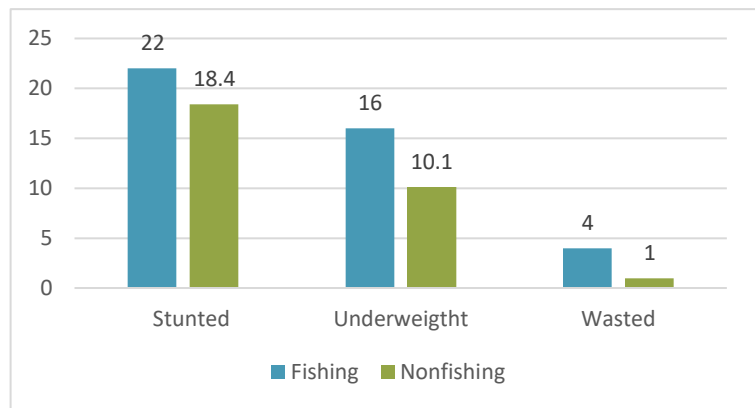
1. Identify nutritious and affordable marine fish foods that support or maintain ecosystem functioning
2. Assess the acceptability and feasibility of the fish foods for nourishing vulnerable populations of pregnant and lactating women and young children
3. Determine the market conditions for ensuring availability, affordability, and safety of these foods

Data collection occurred along the coast of Kenya in four communities: Vipingo, Uyombo, Shimoni, and Tiwi. Our nutrition sample consisted of fishing ($n = 100$) and nonfishing households ($n = 100$) with children less than five years of age. Mixed methods were applied including quantitative surveys with primary caregivers and children five years of age or younger. We also conducted qualitative research via key informant interviews with caregivers of young children and individuals participating in the marine fish value chain. The findings from this study can be used to develop interventions that are aimed at improving human welfare and nutrition using eco-sensitive approaches to fish foods.



PRELIMINARY RESULTS

We collected anthropometric measures on young children with an average age of approximately 2 years, though the children ranged in age from 6 months to 5 years old. Overall, stunting affected one in five children across the sample (20.6%). A higher proportion of children were stunted in fishing households (22.0%) compared to nonfishing households (18.4%). We found 43% of children were reported to consume fish in the previous 24 hours with significant differences by fishing (52%) vs. nonfishing (34%) household ($p = 0.01$). The communities in Kilifi County showed higher stunting rates than those in Kwale county. Underweight prevalence was also higher in fishing households (16.0%) compared to nonfishing (10.1%) as was wasting, though overall prevalence (2.5%) was low.



Prevalence of undernutrition among children less than five years, fishing vs. nonfishing household

The analysis of diets of the children in the sample showed a poor quality diet with low dietary diversity. The low dietary diversity translated to poor nutrient intake of all nutrients analyzed, where no child was able to meet 100% of their daily nutrient requirements for any nutrient in the previous 24 hours. Maize was the primary source for energy and some key nutrients, implying very poor diets for the access of nutrients required for growth and development of the children. It is also clear that fish consumption by the children is very low with most children just being given fish soup without the fish flesh. This provides an opportunity for improving child protein intake amongst other nutrients by encouraging increased consumption of fish. These results show a great need for nutrition education for improved child feeding in these communities.



Woman prepares a meal. Terezia Mosby/MSU

The distribution and access to fish (for local households) from the coastal small-scale fishery was mediated by season and location. The Northeast monsoon (kaskazi) season, where the wind blows from the north, is calmer and catches for all fishes and octopus were higher than in the Southeast (kusi) monsoon season during which the sea is rough. This difference was most pronounced for octopus that had lower prices during kaskazi and higher prices during kusi. The differences in prices during the two seasons are attributed to supply and demand dynamics. The prices of fish were generally lower in the South Coast than the North Coast, and thus was the revenue accrued to actors. This could be attributed to the fact that traders in the South Coast travelled long distances (>5 km on average) to the landing sites and that their

recurrent costs (due to long travel distances) likely played a role in keeping fish prices low. We saw more evidence of fish preservation in the value chain at our North Coast sites due to high prevalence of different capacities of fish storage infrastructure.

The value chains for each fishery (i.e., octopus, pono, tafi, changu) differed:

- Octopus flowed through women fryers to consumers and supported the most diverse assemblage of actors
- Most changu (emperor) flowed through women fryers either directly or via large-scale traders, an indication of the fish's importance in contributing to local consumption needs

- Pono's (parrotfish's) value chains differed from the north to south coast: in the north, the flow was from fishers to women fryers to consumers, and in the south, the flow was through large scale traders
- Most of the tafi (rabbitfish) flowed to consumers from women fryers through large-scale traders and supported a diverse set of actors in the value chain.

In most of the value chains, large-scale traders were predominant actors, controlling comparatively large volumes. Fisheries landings indicated that changu are being overfished severely because catches consist of primarily juveniles while tafi are the most sustainable and most resilient (to overfishing) catch of reef fish. Pono catches consisted of immature individuals as well. Pono serves an important role in coral reef ecosystem functioning as herbivores and as such, its population is vital for environmental health.

CONCLUSIONS

Our findings showed small fisher households along the Kenyan coast, despite livelihood engagement in fisheries, lacked dietary diversity and were more malnourished in terms of stunted growth and underweight status than nonfishing households. Cost was a major impediment to use of fish in children's diets that might be mitigated through increased production. Caregivers expressed receptivity to nutrition education, opening the opportunity for improving feeding behaviors and fish in children's diets. The fisheries value chain analysis revealed that octopus play a critical role in the livelihood and wellbeing of fishers and coastal communities, and that the three major types of finfish (tafi, pono, changu) all support diverse and complementary sets of actors. Tafi emerged as the most sustainable fish to harvest, as its catches indicate mostly sustainable harvesting, while juvenile changu are being caught and pono are incredibly important for healthy coral reefs and thus are vital to keep in the water to maintain ecosystem functioning. SecureFish offers formative research that will now be applied to design an intervention that integrates sustainable fisheries production with social marketing for nutrition security among small fisher households on the North Coast of Kenya.

REFERENCE

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ABOUT THE FISH INNOVATION LAB

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