

OCEAN SCIENCE IN ACTION

9.2 WHEN FOOD SECURITY IS INSECURE – A CONCEPT OF FOOD SECURITY EXPLAINED WITH THE HELP OF SMALL PELAGIC FISH

VIDEO DURATION– 06:50

Food security is a major global challenge that is expected to escalate following population growth and the accelerating pace of climate change.

With expanding populations and subsequent increasing food demand, some scientists have suggested relying on fish to feed the 9 billion people expected to inhabit the planet by 2050.

Around 821 million people are currently affected by food deprivation or chronic undernourishment, and almost 90 percent of global marine fish stocks are now fully exploited or overfished.

Given the spotlight placed on fish to provide an adequate food supply to the growing global population, it is important to assess the role of fish in food security. Marine food security assesses a portion of the total food system in a country, essentially zooming in on the marine products on a typical plate in a household, and focusing on the fishing industry in a country's economy.

Estimates suggest that 30 to 60 million people in the Western Indian Ocean's coastal communities are dependent on the coastal environment for goods, services, livelihood and income. However, data for many fisheries are underreported, especially in less regulated small-scale fisheries. Marine food security aims to shed light on these communities that aren't accurately represented in national statistics, but are highly dependent on the ocean.

In these lectures, written by Sarah Taylor from the National Oceanography Centre in the UK and Narriman Jiddawi from the Institute of Marine Science in Zanzibar, you will be introduced to the concept of food security and learn about four dimensions, or four pillars, of food security using a case study of small pelagics in Tanzania.

The Food and Agriculture Organisation of the United Nations defines Food Security as a state

“when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life.”

This definition implies four components or four pillars of food security: Availability, Access, Utilisation and Stability of food sources. When even one of these pillars is unstable or non-existent, people can live in a state of food insecurity. We will focus on each of these pillars in the forthcoming lectures.

Before we get into these, it's important to clarify the difference between direct and indirect food security.

Fishing contributes to direct food security when, for example, a fisher eats all or a portion of catch. But, if the fisher sells his catch then this contributes indirectly to food security, through receiving cash from the sale to buy other types of food necessary for a healthy diet, such as vegetables or rice.

In the Western Indian Ocean, fishers and coastal communities rely heavily on fish for both direct and indirect food security. A case in point are coastal communities in Tanzania who depend on small pelagics for food security.

Small pelagics account for approximately one third of the total fish catch of mainland Tanzania and Zanzibar combined, and around 10,000 people are directly engaged in the small pelagic fishery and related activities. On average, Tanzanians rely on fish for 23.4% of their total animal protein intake, with this fraction being much higher in the coastal communities. Fish supply per capita is estimated at 6.7kgs on an aggregated national level in Tanzania, but consumption of fishery products in coastal regions and Zanzibar can be up to 20kgs per capita.

The end-use of the small pelagic catch is diverse as certain species are processed for fishmeal, which is a major export for Tanzania. The low domestic market value of small pelagics makes these nutritious fish an important protein portion of meals to sustain the coastal communities.

Here is **Narriman Jiddawi** to tell us more:

“Socially, it’s a source of food. Economically, it’s a source of employment because the fishermen also make gears, repair gears, and they make their own boats. So, it is a very important activity along the coast. And it’s food, it’s the cheapest type of protein for the local community.”

Small pelagics are small forage fish that live in the surface and near-surface waters on the narrow Tanzanian continental shelf. Most common small pelagics include very familiar species such as sardines, anchovies, and mackerel. These fish are important to food security in Tanzania for many reasons, one being the abundance of the stock. Accessibility is also key as fishers only require relatively small boats and low-cost gear to catch large schools of small pelagics near the surface.

With a changing Western Indian Ocean potentially impacting availability or abundance of fish supply, it is important for the dependency on fish and different levels of food security to be assessed and understood.

The state of food security varies over a range of scales from the individual person to the global level. A nation or region may be generally considered to be food secure based on national measurements, while certain individuals may still suffer from food insecurity based on nutritional intake.

No single measuring tool can account for all dimensions of food security. The Food and Agriculture Organisation or FAO uses the Food Insecurity Experience Scale which, based on eight survey questions, rates the level of individual food insecurity from ‘worrying about the ability to obtain food’ through to ‘experiencing hunger’.

To predict food insecurity at a national level, the FAO uses factors such as Gross National Products, volume of food production and consumption, poverty levels, and the risk of food emergencies. Food trade is also assessed as a measurement of food security. For example, a country may appear to be food secure if they export greater volumes of food rather than relying on imported food.

With this introduction, we can now begin to appreciate why it is important to determine the dependence of communities and countries on fish for food security. Using the highly variable small pelagic fish species relied upon by the coastal communities of Tanzania as our case study, the topic of marine food security will be further explored within the framework of the four pillars of food security.