

Mangrove Food System Codebook

Themes and codes	Description and example codes	Files	References	Sample words include
Consumer Behavior	Choices and decisions regarding what food from mangroves are consumed, how they are processed and prepared and who consumed them.			
Dietary preference	Whether the community prefer or avoids certain foods from mangroves due to their taste, appearance, or cooking method	9	135	Delicious Cook Disgust Eat Fat Fry/fried Boil
	<u>Example quotes:</u> “Yes, some people eat that salty belut (Snake eel), some people eat it, and some don’t” “Yes because it looks like a snake, so we just feel disgusted when we think about eating it.” “Some people love it because ikan tapah (Freshwater catfish) because it has a high content of fat.”			
Flavour	Specific reference to consuming certain species for flavor or taste	9	54	Taste Sweet Tart Tasty Bitter Sour Umami
	<u>Example quotes:</u> “We don’t eat it, we just use it (Nyireh fruit) for medicine as it has a tart taste.” “That fish is really delicious if you cook it with salt and chilli”			
Dietary Risks or Fear	Beliefs and community perceptions of what species are not consumed based on fear or perceived risk.	7	19	Die Toxic Afraid Fear Danger Venomous
	<u>Example quotes:</u> “No, one eats them, you can die from eating it (Pufferfish)” “We are afraid that if we eat Ikan buntal (Pufferfish) we will die. To eat it someone should know how to process it. People in Japan eat them”			
Food processing	How species sourced from mangroves are processed to make food products.	6	19	Process Make

	<u>Example quotes:</u> “The fruit can be processed to flour, and we can use it to make some bakery products.” “We also can use nipa fruit to make sugar, nipa sugar.”			
Demographic drivers	Changes in demographics that have influenced knowledge or utilization of mangrove ecosystems.			
Loss of knowledge	Loss of mangrove utilization knowledge over generations. Can refer to the knowledge of the ecosystem in general or specific species.	6	16	Past Old Knowledge Anymore
	<u>Example quotes:</u> “Old people said we can use it for medicine. But now we don’t know what kind of medicine it can be used for.” “No one makes it here anymore. I think it just in the past people that made nipa sugar”			
Modernization	Any reference to changes over time within the community including shifts in diet, health, and transitions in livelihoods or harvesting activities.	5	7	Tradition
	<u>Example quotes:</u> “Yes, we don’t know because we never eat them (species of crab) anymore. We have plenty of food here, so we don’t have to eat them” “We the traditional fishers lose fast to those who use a big boat with machine”			
Economic drivers	Economic motivation, demand and markets related to sourcing food from mangroves. References to local economic market structures.			
Economic motivations	Reference to selling price, market demand, livelihood and any economic motivation related to species sourced from mangroves	9	54	Sell Expensive Demand Buy Price High Low Market
	Example quotes: “For unam (Large Sea snail) we don’t have market for it. If someone want it, then we will look for it.” “Siput timut (Long snail) sells well, it is 10.000IDR per kilo. But Siput Panjang or TengkuYung (Razor snail) has higher selling price though. It is 18.000IDR per kilo.”			

	“When you work as fish cleaner you can get 40.000IDR per day. If you work as gleaner and you catch a lot that day, you can get more money than that.			
Environmental drivers	How the environment, climate and landscape influence mangrove ecosystems and the supply of food sourced from them. This also includes how industrial actors are influencing or disrupting the local environment.			
Changes in catch	Negative shifts and changes that the community have noticed in their fish or shellfish catch and why they believe this has occurred.	5	34	Catch Reduce Poison Water Lesser Harder Pond Industry Mining
	<u>Example quotes:</u> “In the past we easily can get up to 50 kilograms, now even 5 or 3 kilograms are difficult the other factors that influence the number of our catch is because of people that use trawl equipment to catch mangrove swimmer crab.” “In the past we can find them in nipa tree, however since ponds came to this area, it is harder to find them there.” “Poison, from the palm plantation” “yes” “Those are the factors that hinder our life as fisher”			
Changes to landscapes	Changes that the community notice in mangrove ecosystems and their villages. This refers to the actual landscape, not shifts in seasons	8	40	Ponds Plantation Trash Waste Cut Forest
	<u>Example quotes:</u> “And then another factor is, we as society don’t have any awareness about the trash, we throw into our water.” “Yes, especially plastic” “The more the population the more waste is disposed to the water.” “Yes, I am afraid in the several years our water will be filled with waste.” “In the past we can find plenty of fish there. When there was no plantation” “but before there is plantation but it was small, not as big as now.”			
Environmental protection	Reference to any steps the community have taken to protect their local mangrove ecosystem	1	4	Pivotal Seed Plant
	<u>Example quotes:</u> “We did around that area, when I went fishing with some friends, we bought this much (a hand) of seed. We just plant it along the way’ “We do it because we want to make sure our descendants have it (mangroves) in the future”			

Seasons and Weather	Local knowledge on the role that the weather and season have on mangrove and their ecosystems.	8	51	Season Wave Rain Wind Water level Access Nature
	<u>Example quotes:</u> “In December we have high water level, so the water come into the mangrove (small river), because of this it is easier for us to catch them inside the mangrove.” “So, in the hot season, the water around here will be brackish, so there will be a lot of moss in the water. Fish like it so they will come and swim around it to eat” “Here is the situation. It is easiest for us to glean them during the south season, they are always available. It just the way we glean them that depends on the weather”			
Changes in climate	Community perceptions or statements regarding climate change or changes or shifts in climate patterns over time.	3	12	Worst Change Climate Harder Unpredictable
	<u>Example quotes:</u> “In the past 3 years our weather became unpredictable” “Usually august will be hot, but now we have rain on august” “Maybe it is because of the climate change”			
Local ecological knowledge	Community and local knowledge on mangrove ecosystems and knowledge of the method of harvesting species from mangroves.			
Species habitat and behaviour	Local knowledge on mangrove species’ habitat and behavior	8	37	Live Eat Habitat Climb Crawl Feed
	<u>Example quotes:</u> “They (Blue spot Mullet) can be found in the edge of mangrove. When the water level is high, they will come into the river. Inside the mangrove we can find small river, that is where they live. They like to eat moss in the edge of mangrove” “The crabs’ food is taken away by that trawl equipment”			

Harvesting method	References to the harvesting method or the use of specific equipment to utilize mangroves as food systems.	9	88	Rod Trawl Knife Hand Boat Fishing Glean
	<u>Example quotes:</u> “We usually catch it if we use trawl, most trawler catch it. But for traditional fisher like us who use fishing rod, we rarely get it.” “When we pick up clams, we use knife, some of them appear on the bank, but some are invisible, so in that case we use our knife to find them. When our knife touch it shells, it will make a sound “tek”, it’s mean we found clams, then we pick them up with our hands”			
Species classification	Any reference to how the community classifies or distinguish species they harvest from mangrove ecosystems	9	93	Colour Shape Size Fresh water Salty water Skin
	<u>Example quotes:</u> “Blue spot mullet has short and small body, the Flathead grey mullet is the female version of the Blue spot mullet, and the long one is the male mullet” “It just different name but same fish. Fish have different name like us, we have Chinese, Dayak, Medura, and Malay people, fish have that as well”			
Personal barriers	Physical, mental, or traditional barriers or challenges that the community face when entering or utilizing mangrove ecosystems.			
Gender	Community perceptions on the gendered difference in mangrove utilization. Can include reference to landscape, equipment, knowledge and more.	5	12	Men Women Like Fishing Experience
	<u>Example quotes:</u> “Sometimes when I glean for clams, my husband asks me to stop because it will make you tired.” “We do it because we like it, even when we are at home, I usually persuade my husband to allow me to go fishing with him.” “My husband said, “It is raining, our kids will be drenched” I said to him” I am bored at home, I want to go fishing.”			
Ability	Relates to any reference to physical ability including challenges in conducting mangrove livelihoods or harvesting activities.	8	17	Hard Strong Exhausted Age
	<u>Example quotes:</u>			

	<p>“The selling price for clams is low, but the way we glean it is hard.”</p> <p>“Our mothers don’t have strong body like before to glean.”</p> <p>“That time they should walk when they set the trap and walk again when they collect it” “Yes, collecting the trap while walking is hard”</p> <p>“We just exhausted ourselves”</p>			Difficult
Fear	The feeling of fear related to utilizing mangroves and interacting with species found with the landscape and ecosystem.	8	42	Afraid Fear Scared Nervous
	<p><u>Example quotes:</u></p> <p>“I have been bitten by a crab when I searched for clams. It crawled inside my clothes. Ouch, when it bit me, I thought it was snake, that scared me.”</p> <p>“During this season now, we have big wave so people afraid to go to the sea, in south season it will be safe”</p>			
Local beliefs	Beliefs, stories, or ways of knowing related to species within the mangroves that have been passed down through the generations.	7	32	Believe Story Ghost Origin People
	<p><u>Example quotes:</u></p> <p>“Based on our local folklore, people believe that jellyfish came from placenta of sea ghost, so if you know their origin, then you know the cure for the sting.”</p> <p>“Crocodiles and mangrove monitor lizard are the same species. They came from same ancestor (reptile). If the crocodile lay its egg, and its tail reach the land, the egg turns to be mangrove monitor lizard, but if its tail goes into the water, the eggs will be crocodile.”</p> <p>“We are descendants of the fire eel”</p> <p>“We say “If someone in the sea can cure my diseases, we won’t eat you until my 7th descendent, I will never eat them”</p> <p>“People in the past like to make oath”</p>			
Risks	Local knowledge on the risk associated with harvesting of fishing for species within the mangroves.	7	34	Sting Stung Blood
	<p><u>Example quotes:</u></p>			

	<p>“So, when we are looking for crabs, we usually go from the shore to the middle of the sea, but if the water level high, we will stop our activity. Because many fishes will come into the river inside the mangrove. If they sting us, that is so painful, like eel tail catfish and jewfish. We even cry. It is worsened with Spotted scar/butterfish. So painful”.</p> <p>“Jellyfish is the most dangerous one, biggest threat for us”</p>			Thorn Pain
Political and Institutional drivers	Government and institutional structures that influence the community’s utilization of mangroves. This includes references to illegal trade, species protected by law and struggles caused by power imbalance leading to conflict.			
Conflict	Issues surrounding land tenure, conflict between different parties utilizing mangroves and working in the landscape	3	25	Punish Fight Gun Jail Angry Greed Selfish
	<p><u>Example quotes:</u></p> <p>“Someone uses poison to get fish or any seafood, our community will give him heavy punishment, even we can burn that person alive”</p> <p>“If I wasn’t there, people burned him. Because here we use “law of the jungle” here”</p> <p>“I think it is difficult to have a discussion because the person that related to those ponds are the government officer. People who have money. They join the business as well. Yes, we are just a fishers’, we don’t have any right to be angry We cannot ask people to close the ponds. Because the head of village gave them permission to open even though it makes your life harder”</p>			
Protected by law	Community knowledge or perceptions on whether a species that is sourced from mangroves is protected by law	4	20	Law Protected Rare Illegal
	<p><u>Example quotes:</u></p> <p>“Wild cats are rare, that’s why it's protected by law.”</p> <p>“it’s illegal to sell crocodile... mostly people catch it for its skin”</p>			
Socio-cultural drivers	How culture, traditions and people shape mangroves as a place-based food system. This includes community and individual values, health and wellbeing, food cultures and barriers such as gender inequality.			
Women’s empowerment	References to feeling empowered as a woman and the ability to utilize mangroves.	4	6	Experience Know More Women
	“Because we are a woman with many experiences usually the male fishers fish in areas that aren’t as complex as the ones we visit, the female fisher”			

Autonomy	Any reference to freedom or independence in relation to the utilization of mangrove ecosystems	2	6	Freedom Spirit Work
	<u>Example quotes:</u> “We have a boss who buys our fish. But with this type of job, even if we have a boss who buys our fish, we can decide when we want to work by ourselves.” “That is the reason I keep go fishing. Because I have freedom”			
Enjoyment	Any reference to joy in relation to accessing or utilizing mangrove ecosystems	5	19	Like Love Hobby Fun
	<u>Example quotes:</u> “Yes, because we like it. In term of money, alhamdulillah we always have enough income from gleaning. We love the job.” “(fishing) is like a hobby for us” “That is the nature of our work, we just go with the flow People who do it can learn a lot.”			
Food and culture	Community perceptions or beliefs about how certain groups (including age, race, gender, or religion) consuming specific species sourced from mangroves and their ecosystems.	5	13	People Ethnicity Area
	<u>Example quotes:</u> “Jellyfish in Padang Tikar they can be sold. Chinese know how to process it.” “Chinese people eat fiddler crab. But they don’t dare to eat Puffer fish. If they dare do so, tell me. I believe they won’t. But people in Japan eat Puffer fish.”			
Pride	Expressions of pride over working or living in the mangroves	4	15	Brave Experience Strong Job
	<u>Example quotes:</u> “In her case, she’s been gleaning since she was a maiden till now when she has grandchildren.” “People come to my house and asked, what kind of magic did I use?” “I never strung by the bee, I told him I don’t have any magic, I’m just brave enough to get close to the bee.”			
Social capital	Social benefits gained from mangrove including spending time together or working as a group.	4	7	Friends Together

	<u>Example quotes:</u> “We love the job. We usually go together and eat together near nipa’s tree” “We meet a lot of friends when fishing”			Love Meet
Non-food ecosystem services	Traditional and non-traditional uses of mangrove trees and the species found in their ecosystems by the local community. This includes traditional medicine, using species to create beauty products and the use of mangrove timber.			
Traditional medicine	Refers to health practices, knowledge, and beliefs regarding the utilization of mangrove species including animals, aquatic species, and plants for therapeutic benefits or to treat an illness or promote wellbeing	8	52	Medicine Purpose Fruit Cook
	<u>Example quotes:</u> “I think that bird’s nest can be used for 44 types of medicinal purpose, because they make their nest from many types of trees, and that mangrove tree can be used as medicine.” “Yes, she (my mother) said to me that we can use Nyireh fruit as medicine. I asked her, what kind of medicine? She took the Nyireh fruit and showed me how to use it. She took it and peeled off its skin, took the meat and then chopped it and then dry it. After she dried, we, she mashed it, and then you mixed it with powder “cap nona”” “Yes, and for baby the Nyireh Fruit is used to make their umbilical cord dried faster”			
Beauty	The utilization of mangrove species to create beauty products/cosmetics.	3	4	Powder Face aging Skin Beauty
	<u>Example quotes:</u> “We can use it for face powder and for stomach aches.” “We can use it to lighten the skin and as anti-aging Yes, as anti-aging.”			
Timber	Community views on the utilization of mangroves for their timber/wood.	4	13	Wood Cut Charcoal Forest
	<u>Example quotes:</u> “But that industry (logging and charcoal) was one of our sources of income even though government forbid it.” “Yes because of several factor. We discuss this issue with the government because cutting mangrove was forbidden.”			

	“Actually, that activity (cutting the mangrove for charcoal) damages our ecosystem”	
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