

## Water sources by usage type Written by Danko Taborosi

- Drinking

Main source: **RAINWATER**

Additional source: **COCONUT WATER**

Emergency source: **GROUNDWATER**

Drinking water is obtained from rainwater catchments. Each compound on the island has access to one or more tanks to satisfy their daily needs. During dry periods, people may run out of rainwater supplies and turn to their neighbors and relatives. This is an annual occurrence for many families. If a shortage persists, drinking water is obtained from wells and is boiled prior to consumption. This is because the island has practically no community tanks to act as reserve when individual families' supplies are exhausted.

A significant portion of overall hydration comes from drinking coconuts, which are consumed at a rate of 1-4 per day per person during normal times, and more during times when rainwater is in short supply.

It should be noted that the island has received about 10 years ago an array of small portable solar desalinators that remove sea salt through evaporation and condensation. These are still to be seen in individual households, but have either been dismantled and used for parts (as plastic shelves for dishes, etc.) or are utilized to obtain salt rather than fresh water.



Filling a bottle with water from a plastic rainwater storage tank. People usually do this several times a day so as to always have drinking water at their homes.



A bunch of drinking coconuts on a palm tree. We found that coconuts are ample on Ifalik, but sparse on Eauripik.



Pouring water into a plastic cup. This photo was taken in Eauripik Atoll. We did not see taps of this type connected to catchment tanks on Ifalik Atoll.

# DRAFT. Please do not cite or circulate. By iREi / WERI.

Main source: **GROUNDWATER**

Additional source: **RAINWATER**

## ● Cooking

Local root crops and thick-skinned fruit such as breadfruit require cooking for a long time. Cooking of such items, especially those that are peeled and do not absorb a lot of water, is done exclusively with groundwater. People in some households, particularly in places where the interviewees included women, reported the cooking of taro and similar foods to be the most water-consuming activity they engage in. That is probably the reason why rainwater, in its limited supply, is never used for this purpose.

In contrast, cooking of rice, fish soup, noodles, and any imported foods that require less water and time to prepare, or absorb a lot of water, or are consumed with the water in which they are cooked, are most commonly prepared using water from rainwater catchment tanks.



Preparing dinner for the family. Cooking in Ifalik takes place in separate structures referred to as cookhouses.

## ● Dishwashing

People wash their dishes using water from wells or in seawater. In general, people who reside inland use groundwater and people who reside near the shore use seawater for this purpose. In addition, washing in seawater with a rinse using water from wells is also common practice, typical when the dishes are greasy. Regular dishwashing does not involve the use of dish soap or other chemicals.

Only a couple of families have reported the use of rainwater to wash dishes, but only when there is ample supply.

On Eauripik Atoll, interviewees said that the dishes are washed almost exclusively with seawater.

Main source: **GROUNDWATER**

Additional source: **SEAWATER**

Occasional source: **RAINWATER**



A child posing next to dishes prepared for washing.

## DRAFT. Please do not cite or circulate. By iREi / WERI.

- Cleaning root crops and other local foods

Main source: **GROUNDWATER**

Traditional root crops such as swamp taro (*Cyrtosperma merkusii*), sweet taro (*Colocasia esculenta*), wild taro (*Alocasia macrorrhizos*), arrowroot (*Tacca leontopetaloides*), sweet potato (*Ipomoea batatas*), cassava (*Manihot esculenta*), the relatively recently introduced new world taro (*Xanthosoma sagittifolium*), as well as seeded breadfruit (*Artocarpus altilis*), non-seeded breadfruit (*Artocarpus mariannensis*), and other local foods require thorough washing, peeling of skin, and preparation before they can be cooked or otherwise processed. Water used in washing, peeling, and similar procedures on locally grown food comes from the wells. None of those foods are eaten raw and require prolonged cooking before consumption.



An old lady cleaning breadfruit and peeling its rough skin.

- Cleaning meat

Main source: **SEAWATER**

Additional source: **GROUNDWATER**

Slaughtering and cleaning of large animals (dogs, turtles, pigs) and smaller animals (chickens, seabirds, fish) can take place on the lagoon-facing or ocean-facing shore of the island, where blood and unwanted entrails are washed away by seawater. It can also take place within one's household, in which case groundwater from a well is used for cleaning.

Small animals' meat is often cooked in water, but larger animals, particularly dogs, pigs, and turtles are generally baked using a type of earth oven locally known as *uumwu*. This oven is made from coral rocks heated on open fire and placed on top of the meat being baked.



Father and son cleaning blood and entrails from a slaughtered dog. Dog meat is common food in much of Micronesia.

## DRAFT. Please do not cite or circulate. By iREi / WERI.

Main source: SEAWATER

Additional source: GROUNDWATER

### ● Bathing

Bathing by both children and adults is limited to seawater, almost exclusively on the lagoon-facing side of the island. The only exception are baths for babies, which can also utilize groundwater from a nearby well if the family has a plastic tub that is suitable for such use.

Ifalik lacks standing bodies of water other than natural and man-made depressions where the land surface reaches below the water table. Most of these depressions are referred to as taro patches because they are used to grow taro (see “Cultivating wetland crops”). Smaller depressions that are not planted with taro appear as ponds and are often used as part of the process to extract coconut fiber (see “Other uses”).



Group bathing in Ifalik's lagoon at sunset.

### ● Rinsing and showering

Main source: GROUNDWATER

People may or may not wish to take a rinse with fresh water after bathing in seawater. If rinse is preferred, it is done using groundwater from a well. Many wells are dug along the coast, particularly in places where people swim, to be convenient for rinsing. These coastal wells are typically near canoe houses on the lagoon-facing side of the island and are simple excavations in sand, without any lining or improvements. It should be noted that Ifalik cultural practices require pregnant women to reside in coastal huts (mostly canoe houses) away from their normal place of residence. During such times, pregnant women also use the water from coastal wells for personal hygiene and daily needs other than drinking.

In addition, rinsing with water from a well is needed by people returning from fishing or work in the taro patch. In particular, work in the taro patch (usually performed by women) is very difficult and gets a person quite sweaty and covered in mud. Wells made near the taro patches or near residences are used for this purpose.



Girl and boy rinsing off after helping their mother in the taro patch. The girl is holding a bucket made of a cut buoy that drifted to the island. Plastic or rubber buoys are the most common tools used to pull water from wells.

# DRAFT. Please do not cite or circulate. By iREI / WERI.

Main source: **GROUNDWATER**

Additional source: **SEAWATER**

- Washing laundry

During interviews, families have reported to exclusively use groundwater from wells to wash laundry.

However, observations around the island have shown that laundry is regularly pre-washed in saltwater of the lagoon or the fringing reef on the ocean-facing side of the island, and then washed in groundwater after that first step. Presumably, items that require little cleaning would go only through groundwater step, but items that require a more thorough wash would pass through a seawater pre-wash. Regular washing of laundry on Ifalik does not involve the use of detergents or other chemicals.



Washing laundry in the saltwater of the lagoon.



Washing laundry using fresh water from the nearby well.

## DRAFT. Please do not cite or circulate. By iREI / WERI.

### ● Cultivating wetland crops

Exclusive source: **GROUNDWATER**

Swamp taro (*Cyrtosperma merkusii*) is a vital crop on Ifalik and has been a staple food since ancient times. It requires partly waterlogged ground to grow and is planted in excavated depressions where the land surface is near the water table. The largest of these depressions were created and maintained by many generations of people, going back centuries to the original settlement of the island. In addition, swamp taro is planted in other wet areas such as old wells and smaller dug out pits. This type of agriculture is entirely dependent on the quality of groundwater and the position of the water table. It is extremely sensitive to saltwater intrusion, both from the ground as well as overwash from waves.

Some newly introduced food crops, notably kangkong (*Ipomoea aquatica*), also depend on wetland conditions. Other taro species on Ifalik (see “Cleaning root crops and other local foods”) do not require water-saturated ground, but do grow well along taro patch edges.



Children working in the taro patch. They are adding compost to the soil to make the ground suitable for sweet taro (*Colocasia*) cultivation. Compost is usually not needed for cultivation of swamp taro (*Cyrtosperma*) (on picture).

### ● Watering plants

Main source: **GROUNDWATER**

Plants on Ifalik are generally sustained by rain and groundwater and there is no deliberate watering by people. However, local and introduced vegetables in gardens, various herbs and decorative plants around houses, and young trees being raised from seedlings or cuttings may be given water during periods of little rain. Water from wells is used for this purpose.



Boys playing in the garden surrounding their family compound. The spread out plants on the ground are pumpkin plants.

## DRAFT. Please do not cite or circulate. By iREi / WERI.

- Providing water to domestic animals

Main source: **GROUNDWATER**

Most families on Ifalik keep a small number of pigs, dogs, and chickens. Pigs are usually kept tied to a tree and dogs and chickens are free to roam. Young pigs are kept in enclosers. Water given to domestic animals is exclusively groundwater, usually taken from the well of the lowest water quality that a family possesses. Some wells that are poorly maintained are used only to get water for animals.



A young pig in its pen.

- Toilet

Main source: **SEAWATER**

Other than one pit toilet excavated in coastal sand for the use by visitors, we did not see any other toilets on Ifalik. Defecation in the bush and on beaches is common, though this is said to be done mostly by children. A more standard and culturally appropriate practice is disposal of human waste directly into seawater of lagoon or ocean-side of the island. Specific tidepools, rock outcrops, and rock piles on the fringing reef on the ocean side are consistently used for this purpose.

At low tide and especially early in the morning, many people can be seen walking on the reef, ostensibly for the purpose of going to toilet. On the lagoon side, there is no extensive shallow reef flat so waste is left on the beach and cleared off during high tides.

Absence of pit toilets and septic tanks on the island certainly contributes to overall good state of groundwater. This enables residents to use groundwater for many purposes and reduces the demand on rainwater. People have never expressed any dissatisfaction with this arrangement so we suggest that consultants or other outside groups refrain from suggesting a change to this centuries-old traditional practice that continues to have clear benefits.



An early morning visit to the toilet. This photo was taken on the island's ocean side, at low tide. Tidepools and rock outcrops on the fringing reef provide optimum places for bathroom needs, far from the shore for privacy.

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## ● Recreation

Main source: **SEAWATER**

Ifalik is surrounded by seawater, the quiet lagoon on one side and ocean-facing fringing reef and outer reef slope on the other. The lagoon side of the island is where people congregate at the end of the day, when daily chores have been completed. Especially around sunset time, many children and adults can be seen playing and relaxing in shallow water and on the beach. These recreational activities are linked to seawater are extremely important for the community on Ifalik. This is particularly true for children. Their proper education and development requires them to learn to swim well, know how to obtain resources from the ocean, understand weather and tides, construct and use canoes, and gain other skills essential to their lives as adults.



An Ifalik boy playing with his self-built toy sailing canoe.

## ● Fishing

Exclusive source: **SEAWATER**

Seawater that surrounds Ifalik is where the local people catch fish and other seafood they consume. Marine fish, mollusks, arthropods, and other organisms have always been a dietary staple and the primary source of protein here and on other Pacific Islanders. Consequently, normal seawater temperatures and quality are essential for local food security. We have received disconcerting reports of deepwater fish dying in the lagoon and washing out onto the shore during times of extremely low tides, possibly a result of eutrophication.

We have noted unidentified species of fish and crustaceans living in the fresh groundwater, but these are minuscule and not consumed.



Yellowfin tuna catch brought in by fishermen in the canoe in the background.

## ● Other uses

Exclusive source: **GROUNDWATER**

People on Ifalik rely on traditional skills and local resources to make clothing, tools, vessels, and houses. Various material culture processes, from extracting plant fiber for local cloth to making watertight seals on outrigger canoes, require water at some stage. Usually, groundwater is fetched from a nearby well for such tasks. One process that demands lots of water is the extended soaking of coconut husks to prepare them for extraction of fiber to make coconut rope (essential for building houses and canoes). This is done in small pond-like depressions made for this purpose.



Old coconut husks soaking as part of rope making process.