

Self-sufficiency in food: prospects on the island of Fuwahmulah, Maldives

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ABSTRACT *This article presents the findings of a study aimed at assessing prospects for self-sufficiency in food on the island of Fuwahmulah, Maldives. A mixed research methodology combining a survey on a representative sample and key informant interviews was used to elicit responses from households and crop growers respectively on their existing staple food items, perceptual suitability of locally grown crops as staple food and key issues affecting the cultivation of crops on the island. The research finds that the top three items consumed as staple foods in households are imported produce and items. Responses also indicate that locally-grown crops are perceived as suitable staple food for the island folks. The research concludes that prospects exist for a significant level of self-sufficiency which may be achievable with needed support.*

KEYWORDS *food security; self-sufficiency; staple diet; staple food; agriculture;*

As the world reels from the colossal impact afflicted by the COVID-19 global pandemic, debates that intensified on many aspects of life as we used to know it continues unabated. One of the most important areas thus being discussed around the world is food security. This article contributes to this debate in the Maldives by studying prospects for self-sufficiency in food on the island of Fuwahmulah.

The COVID-19 pandemic appears to have stirred imaginations on scarcity of food, and hence an apparent motivation to renew efforts to grow more food locally. Anecdotal evidence suggests that folks have become more aware and sensitive to the risks of being entirely reliant on imported staple food.

According to the Fuwahmulah City Council (FCC) the island is 4.94 square kilometres in size, out of which unused land is just 4 per cent. The size of land available for cultivation is 76,000 square metres (0.1 square kilometres), which is 0.01 per cent of the total land area of the island. At the end of May 2020 some 246 people (0.02 per cent of the resident population) were engaged in cultivation of arable crops. The estimated total registered population of Fuwahmulah and the number of people living on the island at the end of 2019 was 13,062 and 14,001 respectively (Fuwahmulah City Council, 2020). Habitable area is around 3 square kilometres (300 hectares) (Ministry of Environment and Energy, 2014).

Surrounded by a 15.3 km coastline, Fuwahmulah is also the third largest island in the Maldives (Ministry of Environment and Energy, 2014). It is located in the south of Maldives and is in the highest rainfall zone. It has the second largest freshwater reservoirs in the Maldives. It also has two freshwater lakes or kilhi in the local dialect. Of the total land area, 30% is wetlands, the largest in the Maldives.

Fuwahmulah is known for its diverse food trees and crops. The crops are grown in the form of backyard agriculture across the island and most of the households have taro pits (Ministry of Environment and Energy, 2014) in their backyards. For commercial purposes agriculture plots are leased by the council from the northern end of the island. These are leased for the growing seasons, especially for the month of Ramadan. In 2009 Fuwahmulah was the second largest producer of bananas that supplied to the Malé Local Market (Ministry of Environment and Energy, 2014). Fuwahmulah is known for its supply of coconuts, taro, pumpkin, butternut squash and watermelon.

Objectives

The broad objective of this research was to assess prospects for attaining self-sufficiency in staple food in Fuwahmulah. Current use of staple food and perception of local households on the suitability of locally-grown crops as staple food was used as an indicative proxy for prospects. The specific objectives were: (1) to quantify households that use rice, flour, sugar (which are all imported), taro, breadfruit or any other locally-grown crops as their staple food; (2) to assess the suitability of locally-grown crops as main staple foods for households; and, (3) to discuss non-exhaustively issues on and related to the cultivation of crops on the island and aiming for self-sufficiency in food for the island folks.

While it is generally known that for their main meals of the day most people in the Maldives consume rice- and wheat flour-based meals, it would be useful to describe this information in numbers. From common knowledge and from the researchers' historical experience of Fuwahmulah, it was already known that some staple food type crops are grown on the island. A higher percentage of households rice- and wheat flour-based meals would indicate that attaining self-sufficiency based on locally-grown crops would be more challenging than it might be otherwise. Such information would also give an indication of the requirement for increasing production of local crops.

Literature review

As stated in the report of the World Food Summit 1996, food security is achieved in a place when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life (FAO, 1996 cited in (Najeeb, 2020)). With this in mind the study looked into one aspect of this definition, i.e. that people in that place must have access to sufficient food either grown domestically or imported.

Food security is generally understood as to incorporate four main pillars: food availability, food accessibility, food utilization and stability. It is believed that all four components have to be sufficiently present for food security to exist (FAO, 1996). There are three important food security indexes that many analysts use in food security studies. That is food availability, food self-sufficiency and food trade. FAO (1999) and Clapp (2016) define food self-sufficiency as “to the extent that a country is able to satisfy its food needs from its own domestic production”.

Food security in Asia has been traditionally defined on the basis of maintaining a stable price in rice in most of the countries as 50 per cent of the population considers rice as staple food. For South Asia, rice is considered as the staple food for more than 70% of the population which is the highest compared to the rest of the world (Bishwajit et. al, 2013). The study which focused on food security in the SAARC region by Bishwajit et. al, (2013) states that food security is essentially a reflection of rice security in the region as it is the second largest rice producing region in the world. This assumption is based on the fact that for many countries in the region rice production seems to be an effective way to promote national food security and in doing so, to achieve self-sufficiency as well. The study focused on India, Nepal, Bangladesh, Pakistan and Sri Lanka.

Porkka (2013) in their study addresses that food security cannot be analysed by focusing on sufficient quantities of food. As sufficiency is more of food availability, it needs to focus on the other three main pillars, which is food access (sufficient resources to obtain food), utilization (appropriate use focused on nutrition) and stability (of all these dimensions). It is believed that all four components have to be sufficiently present for food security to exist. Food security is usually addressed on a countrywide basis or within country groups or at a global level.

Food self-sufficiency also refers to countries that want to increase their own domestic production (Clapp, 2016). It can also be applied to countries that close its borders to food trade and concentrate on domestic production (Wegren & Elvestad, 2018). This is by large an unlikely scenario as most countries who are large exporters are as well importing some of their food (Clapp, 2016). There are many ways self-sufficiency in food is measured. Through self-sufficiency ratio (SSR) which is the percentage of food consumed that is locally produced (Chernova et al., 2020) and through the dietary energy production (DEP) per capita within a country. A country has to produce over 2,500 kcal per capita per day to be self-sufficient (Clapp, 2016). The study by Clapp (2017) has looked at the definitions of the concept, the measurements used to capture it for policy purposes and states that self-sufficiency in food is more to do with a country's domestic capacity to produce food rather than rejecting food trade. The study also highlights that if countries choose to implement food self-sufficiency, the tools should depend on the resources available to them.

Even though food self-sufficiency is a part of achieving food security, there is one difference between them. Food security is about access (price), availability and nutrition without regard to the origin of food (Wegren & Elvestad, 2018). Food security encompasses components of the food system, the imports, domestic produces, food aid, food stocks and social protection systems etc., which ensures that the populations are accessible to the food and fed (Baer-Nawrocka & Sadowski 2019). However, food self-sufficiency is about self-supply and also deals with the origin of the supply. Food self-sufficiency is mostly about the availability (supply) pillar of food security, so it focuses on the origin of food and more specifically it focuses on domestic production (Wegren & Elvestad, 2018; Clapp, 2016).

A global study conducted by Baer-Nawrocka & Sadowski (2019) on food self-sufficiency around the world, assumed that the food production capacity is determined in terms of natural factors and that the resulting food security is determined by economic conditions. The study highlights that food production volume and food self-sufficiency depends on natural conditions and food

consumption and food security are impacted by economic conditions which include national wealth. So, in short, a country can be food secure if the country holds enough financial resources to import goods. A self-sufficient food system can be both an importing and an exporting country. But this is again defined in caloric terms. For example, if one country is self-sufficient on national scale, they may produce crops such as grains, and may export, and in return they may need to import fruits and vegetables to feed the population. Clapp (2017) stated that for individual countries, policy stance on self-sufficiency should be based on its own unique circumstances.

For many island nations including Maldives, food security is dependent on imports as local or domestic agriculture is limited due to scarcity of land and suitable soil for most crops and also due to challenges created by environmental conditions and climate change impacts. Similar to the 2007-2008 food crisis, countries relying on external markets want to rely less on the globalised food system amidst the COVID-19 impacts on the food system. The 2007-2008 food crisis led to bans on quotas, high taxes on exports in various countries and led to lack of food supply in countries of the Caribbean and others. Export bans were imposed by Belarus and Russia following the droughts and wildfires in 2010 (Fader, Gerten, Krause, Lucht, & Cramer, 2013) and the recent COVID-19 impact on food security is still yet to be known. The study also implied that an import intensive policy causes many disadvantages to both importing and exporting countries.

Developing goals based on food self-sufficiency can be a huge challenge as there are already existing food security and related issues within the food systems. Security is ensured with increased trade (Wegren & Elvestad, 2018). With trade the country is creating a balance. The notion is that exporting food creates incentives for increased food security through food purchases from that income (Wegren & Elvestad, 2018). Even if the country's population increases, import of food allows the increased resources to feed the population (Dukhnytskyi, 2018). However, such conclusions may be debated based on experiences of crises, for example, COVID-19, where food shortages were felt as a real risk.

Food Security in Maldives

Historically, agriculture played a significant role in the livelihoods of the Maldivian community along with fishing. It was a significant livelihood component in such that it was able to ensure food and income to households (Adheel, 2019). Traditionally Maldives largely consumed cereal crops such as maize (*Zea mays*), sorghum (*Sorghum vulgare*), finger millet (*Eleusine coracana*), fox tail millet (*Setaria italica*), common millet (*Panicum maliaceum*), etc. Starchy crops such as breadfruit (*Artocarpus altilis*), sweet potato (*Ipomoea batatas*), taro (*Colocasia esculenta*) and plantain were abundant in the Southern Maldives (Adheel, 2017).

In the past Maldivian farmers were subsistence farmers and the farming communities can be categorised into various forms. Many factors contributed to what is seen now as the agriculture industry in the Maldives. The farmers moved to short term profitable horticulture crops due to scarcity in land and difficulties in traditional crop management. The decline can also be attributed to increased land value for other developments (Mohamed, 2019). Coconut (*Cocos nucifera*) being a significant crop with an integral part in Maldivians diet, even though

low in production is sufficient in local use. From ancient times Maldivians have consumed coconut and various products from coconut palm (Adheel, 2017), including Maldivian sugar made from coconut sap.

Around 13 per cent of the population is employed in the fisheries and agricultural sectors of the Maldives. Imports of agriculture crops even among those that are produced to some extent in Maldives have been consistently increasing from MVR 302 million in 2014 to MVR 437 million in 2018 (Shakoor, 2020). For COVID-19 emergency policies, the government of Maldives has taken measures to address the food security issues in the country. Experts in Maldives have debated whether the import dependency should be limited, while others believe balancing imports with domestic production so that consumption patterns are diversified based on alternative crops (Shakoor, 2020)).

A study published in Maldives Economic Review (Najeeb, 2020) on food self-sufficiency in Maldives highlights that the government's Strategic Action Plan 2020-2023 lacks recognition of staples and that the plan aims for traditional crops to be used as nutritional security crops while other, e.g. horticulture short term crops are to be used as import substituting self-sufficiency alternatives. An analysis by Mohamed (2020) lists some recommendations in order to address the underlying food security issues existing in Maldives. The analysis also highlights the lack of national food security act or policies specific for food security issues even though donor funded, and various agriculture programs have been ventured to boost the neglected sector. In his analysis he highlights the importance of growing local traditional crops. Some underutilised and neglected crops like taro and breadfruit are significant in the southern islands such as Fuvahmulah and Addu City and were found more prominent in their diet (Adheel, 2017).

Generally native crops grown in the Maldives are underutilised in consumption, due to changing in consumption behaviour and due to declining productivity (Hassan, 2019).

This will be a challenge added to the fact that there is a scarcity of land and the Maldives agriculture sector is more or less dependent on an aging farm population with lack of knowledge, lack of motivation for farming by youth and the major factor being lack of agri-food policies which should have been instrumental in driving the sector (Mohamed, 2018a). The sector should focus on domestic production through the inclusion of traditional crops and use of locally adapted crops into the current farming systems (Mohamed, 2018b). The domestic supply chain has also been highlighted as being a major issue in the Maldives; one of the key aspects, for example, is food distribution to islands in the context of accessibility, and this needs to be addressed by establishing regular and reliable distribution channels (Hassan, 2020).

Methodology

This study used a mixed methodology. For the quantitative part, an online tool was used to survey randomly selected households on Fuvahmulah. For the qualitative part, interviews were conducted with key informants chosen from growers on the island. These key informants were selected based on their local knowledge and experience in growing crops on the island and on food eating habits of locals, so that they would emphasise the interpretation of survey results.

Sampling

Households on the island at the end of 2019 were used as the sampling units for collection of data. The total number of households on the island at the end of 2019 was 1,861 (Fuwahmulah City Council, 2020). For a representative sample of this population and using the confidence level at 95 per cent and error margin at 5 per cent, the survey required a sample of 327 (18 per cent of the sampling population). This was distributed by weight according to the number of households in each of the eight administrative wards of the island (Table 1).

Table 1
Sampling Basis

	N.o. households at end 2019	Required samples
Dhadimagu	236	40
Dhiguwaan'du	219	38
Dhoon'digan	289	50
Funaadu	230	39
Hoadhadu	264	45
Maadhadu	184	32
Maalegan	126	30
Miskiiymagu	313	53
Total	1861	327

Survey

An online questionnaire was used to collect the quantitative data. The questionnaire was first tested and then revised based on the feedback given by eight test respondents. It was then sent out to survey facilitators on the island who then forwarded the questionnaire to randomly selected prospective respondents from each of the wards. The questionnaire was prepared in Dhivehi language on the assumption that the willingness of prospective respondents will be more forthcoming when the questionnaire was in Dhivehi than if it was in English. Questions were themed on preferences of households on consumption of staple food and perceptions on staple food. The number of responses received met the required sample size at given in Table 1. The survey did not aim to distinguish between age and sex of respondents because the sampling unit was the household and not individuals. The survey was analysed using MS Excel.

Interviews

Eight key informant interviewees were selected from the cohort of crop growers on the island and interviewed over the telephone. A key assumption in deciding for the number of key informant interviews at eight was that it would be sufficient to reflect on the prevailing conditions pertaining to growing crops on the island. This was in turn based on the fact that (i) the prospective interviewees were identified by the main research facilitator on the island, who is positioned in a capacity of knowledge of local folks, and, (ii) prior knowledge on the island that the two researchers have, one of them being a native of the island and the other having previous agricultural research experience on the island.

Themes on which questions were asked were crops grown, land, employment, revenue, issues, self-sufficiency, and support needed. For convenience of analysis, questions were asked and notes of responses taken according to these structured themes. Given the decidedly low number of interviewees and the simple structure of the questions, noted responses were simply compared for similarities, and interpretations made and conclusions drawn from them without the need for a technology-based analytical tool.

Results, findings and discussion

The survey for this study was conducted from 17 May 2020 through 26 May 2020 involving 327 participants randomly selected. The number of samples were determined as explained in the methodology section above.

The online survey questions were aimed at determining what crops were most used by households as staple food, what crops were grown locally and out of them what would be most preferred as staple food. Additionally, respondents were also asked about their use of cooking oil, this being an everyday cooking ingredient and given that a potential substitute, coconut oil, is already processed on the island.

Interviews with the eight key informant growers were also conducted within the same period. Key informant interviews were aimed at eliciting responses from growers on aspects related to growing crops on the island and self-sufficiency.

Rice, wheat flour and sugar (white, granulated) are the *de facto* and the officially-recognised staple food of the people, and the government administers the price of, and provides subsidies for these items to the seller so that they are paid the difference between their marked-up price and the government's administered price (Najeeb, 2020). There is limited to no information on how widely they are consumed.

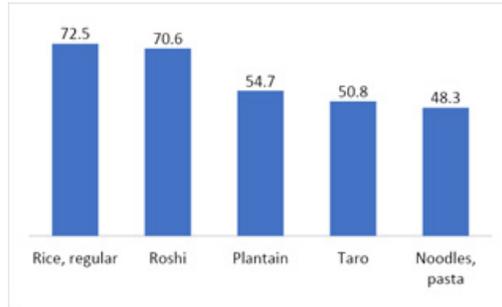


Figure 1: Most often eaten as staple food, %

In the survey conducted for this study, respondents were asked on the most often eaten crop in the household (Figure 1). Nearly 73 per cent of the households eat regular rice as their main staple diet. Combined with Basmati rice, the percentage of the households having rice as their most often eaten staple food rises to 86.3. Wheat flour is the second most used (71 per cent of the households using roshi (roti) as their second most eaten staple food), followed by plantain (55 per cent), taro (51 per cent) and noodles and pasta (48 per cent).

As can be seen from Figure 1, the finding that 71 per cent and 55 per cent of locals eat plantain and taro as staple is encouraging because it indicates that prospects to promote these crops as the top staple foods for the island folks are high since these items are already grown on the island.

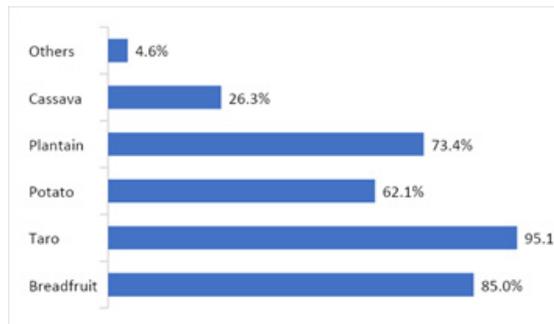


Figure 2: Crops suitable for staple food

Participants were asked what crops in their views were suitable for staple food. In responding to this question, the choice to choose more than one item was given. 95 per cent of the households said taro, 85 per cent said breadfruit and 73 per cent said plantain, 62 per cent said potato, and 26 per cent said cassava (Figure 2). A smaller percentage, 62 per cent of respondents stating that potato is suitable as a staple food is significant because this is not a regularly grown crop on the island as is indicated in the section, “Interviews on experience and views of growers”, but which can be with the appropriate knowledge and expertise. This would also help to diversify staple food type crops at the same time.

¹The sum of all percentages exceeds 100 because for each item questions were posed separately with the choice to select more items than one from a number of given items. The chart only presents the top item from the response to each separate question.

The above responses, however, do not indicate any preference since the question did not ask of any preferential order. Nonetheless, the fact that most respondents said taro is reflective of the potential for taro to be used as the single most important staple food. These are all crops that are grown at varying magnitudes of cultivation as indicated by key informant interviewees (see section on Interviews on experience and views of growers below).

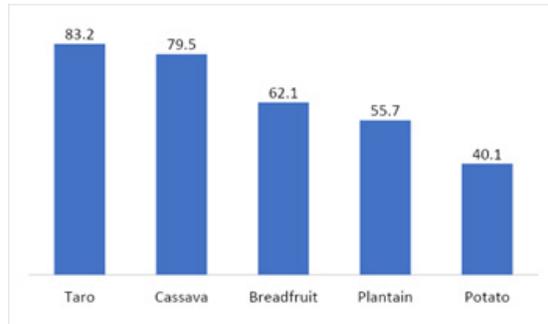


Figure 3: Crops most suitable for staple food, %

Respondents were then asked on the most suitable crops from these for use as a staple food. A high percentage, that is 83 per cent, identified taro as the most suitable (Figure 3), followed by cassava (80 per cent), breadfruit (62 per cent), plantain (56 per cent), and potato (40 per cent).

Out of these six crops, all except potatoes are crops that are always grown on the island. Therefore, with the existing knowledge and experience in growing these items, it may be surmised that if the magnitude of the produce can be increased, the potential to substitute these items for rice and flour may be significant. Moreover, the fact that potato, a non-traditional crop that is intermittently grown on the island as evidenced below in the “Interviews on experience and views of growers” section, provides a prospect to diversify the staple food type crops grown on the island.

As introduced in subsection Current consumption of staple food, sugar, albeit used as a sweetener, is officially recognised as a staple food in the country.

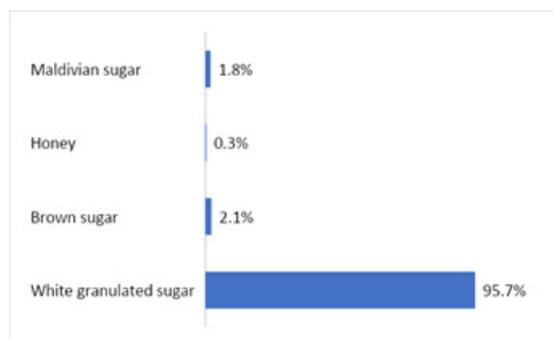


Figure 4: Most used sweetener

This survey indicates that 96 per cent of households use white granulated sugar as a sweetener (Figure 4), and 2 per cent use brown sugar. 2 per cent use Maldivian sugar.

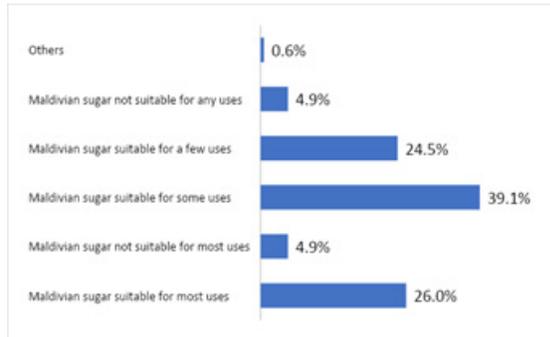


Figure 5: Perception on using Dhivehi hakuru (Maldivian sugar)

Maldivian sugar used to be more widely used as a sweetener until the late 1970s and early 1980s². On being asked about using Maldivian sugar (i.e. coconut sugar, locally known as Dhivehi hakuru) as a substitute for granulated sugar, 39 per cent of households view it as suitable for some uses, 26 per cent see it as suitable for most uses, 25 per cent deem it as suitable for a few uses (Figure 5).

Combined, almost 90 per cent of households say at varying preferences that Maldivian sugar is suitable as a sweetener. Only 5 per cent of the households see it as unsuitable for any cooking uses.

These findings suggest that provided that more Dhivehi hakuru can be produced, prospects to significantly increase its use as a substitute for granulated sugar exist.

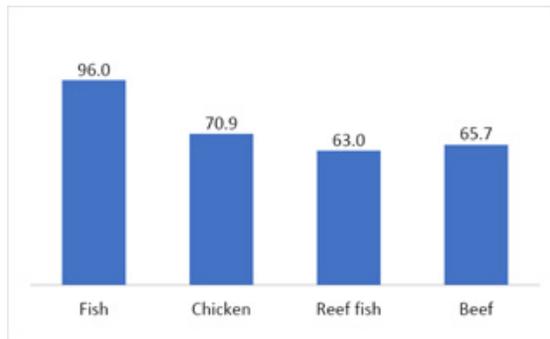


Figure 6: Most often eaten as meat, %

² See footnote 4.

Respondents were also asked about the most eaten meat ³. According to the results of the survey as shown in figure 6, as high as 96 per cent of households consume fish, followed by chicken (71 per cent), reef fish (63 per cent) and beef (66 per cent).

Fish is a staple food of Maldivians as it is a regular element of their main meals of the day. It is also an omnipresent ingredient in Maldivian savouries that accompany tea (or coffee) at traditional tea times between breakfast and lunch and in the late afternoon.

While fish here also includes the popular, domestically manufactured canned fish which is brought to the island by traders, reef fish mainly includes the rare catch by locals.

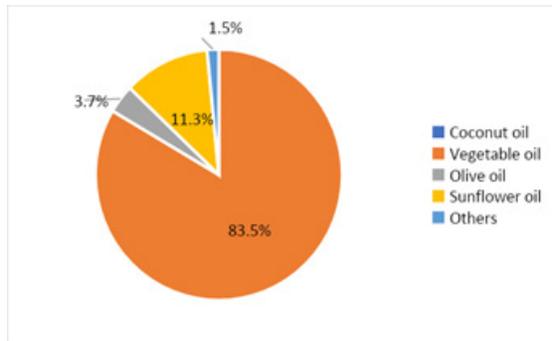


Figure 7: Most used cooking oil

A question was also asked about the use of cooking oil. Nearly 84 per cent of households use vegetable oil, and 11 per cent use sunflower oil (Figure 7).

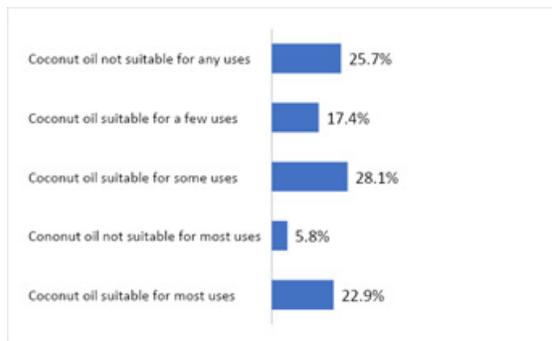


Figure 8: Perception on using coconut oil

On suitability of coconut oil for cooking, 28 per cent said it was suitable for some uses (figure 8). Closely behind, it was seen as suitable for most uses by 23 per cent, and as suitable for a few uses by 17 per cent. On the other hand, 26 per cent said it is not suitable for any use.

³The Cambridge Dictionary defines meat as “the flesh of an animal when it is used for food.”The same dictionary defines fish as “an animal that lives in water, [...], or the flesh of these animals eaten as food.”

The combined total of households that viewed it as suitable at varying perceptions of suitability is 69 per cent while those that had a negative percent on it is 31 per cent.

Given that 69 per cent of households have a favourable view on using coconut oil as the main cooking oil, prospects may be said to exist for coconut oil to be used as the most used cooking oil. Indeed, coconut oil used to be the only oil used for cooking on the island until the late seventies or early eighties; coconut oil was also used for purposes other than cooking.⁴

Interviews on experience and views of growers

Eight local crop growers were interviewed to discuss cultivation in the context of self-sufficiency and related issues that local growers encountered. Out of these three were taro growers, and five were growers of other crops such as vegetables and fruits.

Questions were structured along the following themes: crops grown, land, employment, revenue, issues, self-sufficiency, and support needed. The following paragraphs present the discussion in the interviews.

A wide range of crops is grown on the island. They include, inter alia, taro, breadfruit, plantain, cassava, sweet potato, pumpkin, screwpine (dying down) potato (intermittent), and vegetables and fruits. These include, among others, cabbage, carrot, radish, beetroot, onions, butternut squash, brinjal, tomato, mango, papaya, guava, passionfruit and some other fruits.

While some of the produce is supplied to Malé, most of it is sold locally with mostly leftovers consumed by growers themselves or given away freely to close relatives and friends. One grower mentioned that around 60 per cent is sold and 40 per cent is used otherwise. These interviews confirm findings in literature that indicate that Fuwahmulah also supplies crops to markets in Malé from where folks from other atolls would purchase for sale on their islands in the outlying atolls. One grower stated that they are only able to sell 20 kg of produce per day, and production beyond this is unsellable as they only sell to locals. This appears to suggest that demand for locally-grown crops is constrained by the high level of consumption of rice and wheat flour.

Some use freehold plots registered to a third party; one grower uses one free hold plot of 3,200 square feet, another uses two freehold plots of the same size also registered to third parties. Some others use freehold land allocated to them in recent years for growing crops; one of them uses two plots of 10,000 square feet each belonging to the local government, another grower uses 20,000 square feet of land also belonging to the local government, and another a land of 4,250 also. The common denominator in all cases is the cost-free use of land. Some growers held the view that lack of sufficient land is a bottleneck when considering an expansion of cultivation.

For a successful self-sufficiency strategy therefore, issues relating to availability of land at incentivising terms and costs is likely to be a key factor.

Growers are self-employed, in all cases supported by the spouse, and do not employ paid workers. This is enough for the expectations most of them currently have, which is to sell mainly in the local market.

⁴This assertion is based on one of the author's local experience and knowledge as a native of the island.

⁵The survey also included a part on vegetable and fruit crops consumed and grown on the island, but the findings of that part is excluded from this article because the focus of this article is on staple food type crops.

They usually tend to work twice a day, once in the morning from around 6am to 9am or 10am, and once in the afternoon from around 3pm to 6pm. However, they have to constantly keep a watch on the fields due to the risk of theft.

An expansion of cultivation under self-sufficiency strategy is likely to generate a need for more labour and an interest in employment in this area too.

Net earnings disclosed by growers ranged between a minimum of MVR 3,000 per month to MVR 7,000 per month. Earnings are higher during the month of Ramadan.

All growers identified the lack of land and organic fertilisers as a constraint. Some mentioned problems of pests and weather-related issues such as flooding and wind and damage and loss due to these issues. All identified theft as a major problem due to which they must watch the property round-the-clock particularly towards the harvesting period. Taro growers identified flooding and disease as their primary concern. Taro cultivation has been in decline in recent years due to these problems, and also due to the dying demand for taro as a staple food.

Asked if there was a matter that they would like to receive local or central government support from, all desired to have sufficient land and fertilisers and other agriculture inputs. Some remarked that they needed fertilisers at more affordable prices. Some said that they prefer organic methods and desire to receive assistance in this regard. Growers generally appeared to lament on a lack of active encouragement and support.

All growers were also asked about their views on whether the island could manage self-sufficiency for up to three months. All except one were of the view that with support from the government it was achievable. And they believe that the crops on which this could be done are taro, breadfruit, plantain and cassava. As things currently prevail, Fuwahmulah can only sustain on its own with locally grown crops for about a month. Asked what crop has the most potential to be used as the main staple food, taro was identified as the top candidate. This is consistent with the finding in the survey in which 83 per cent identified taro as the crop that can be used as the most preferable locally-grown staple food.

They identified the seasonally recurring problem of flooding in taro pits and wished to find a lasting solution for it. But some suggested that taro could also be grown on non-muddy fields. In fact, some taro is now already being grown on non-muddy fields; but this approach is not yet widespread. However, following the onslaught of the COVID-19 pandemic, more folks are said to be now interested to grow taro this way.

Asked if and what support is needed from the local council and the central government, some amount of subsidy on consumption of electricity was mentioned. Growers use groundwater pumped by electric motors for irrigation and this they say pushes up their costs. No interviewee mentioned on their own they required any financial assistance.

But when asked if they needed any financial assistance, two said they would rather not borrow, one said borrowing is not justified due to unavailability of economies of scale because the land they grow on was not large enough. But they say some financial assistance is needed. Another said a small loan of around MVR 20,000 was needed, and yet another said a loan of MVR 10,000 was needed (which they said can be paid back fully in three months). Two said they desired some assistance and subsidy on electricity.

All interviewed growers believe that the island folks would be able to survive for at least a month on locally-grown crops. They believe that with planning and support the length of this period could be increased. This view is consistent with many instances of anecdotal evidence from conversations with island folks earlier and throughout the research.

Conclusion

This study finds that the island folks consume rice and wheat flour as their clear top two staple foods. But the findings of this research suggest that some degree of self-sufficiency in food exists on Fuwahmulah. It was, however, beyond the scope of this research to make a methodological assessment of the level of this sufficiency.

Having taken the perceptual receptiveness of households on the suitability of appropriate locally-grown crops as staple foods combined with the existing magnitude of cultivation as a general proxy for an indication of prospects, it may be concluded that prospects exist for increasing the existing level of self-sufficiency in staple foods in Fuwahmulah. This, however, requires support in various forms from the local and central governments.

The findings also suggest that taro has the most potential to be elevated to the top staple food as shown in the priority preferences in this survey, followed by cassava, breadfruit and plantain. Other traditional crops e.g. sweet potato, and screw pine, may be said to have potential to supplement the self-sufficiency capacity. Even though these crops are now considered as alternative crops to imported staples in the Maldives, they may be planned well into food policy programs.

However, substantial support by the state to revive taro, cassava and breadfruit production, as well as other crops identified is needed, including in the following key areas: (1) addressing the issue of flooding and disease on taro plants, breadfruit trees, and other crop trees and plants; (2) finding good taro growing practices to ensure that it grows in the existing taro fields. (3) providing sufficient land to grow crops; (4) facilitating availability of appropriate and cost-efficient fertilizers and other inputs; (5) providing technical and financial assistance (such as adequate loans at concessional costs, terms and conditions, where possible the application of technology in growing crops, growing methods, etc.), and supporting growers in other related issues; (6) supporting post-harvest matters such as storage systems to encourage growing in larger quantities, commercialisation, marketing and selling arrangements as well as campaigns to encourage folks to substitute locally grown crops for imported staple food; and, (7) addressing the problems of pests, theft, irrigation, among others.

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