



# Assessment of Government Financing through Commercial Banks on Seaweed Production in Zanzibar

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## Authors' contributions

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

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## ABSTRACT

This study of Assessment of Government Financing through Commercial Banks on Seaweed Production in Zanzibar. The study aim to help seaweed producers as well as Blue Economy by proving different Financing through Commercial Banks. Using questionnaire for collecting primary data. The study applied quantitative data analysis. Quantitative method was in the form of descriptive statistics using frequency distribution. The finding of the study showed that the finance provided by the Government through Commercial Banks to seaweed producers in Zanzibar such as loan, hire purchase, however many of the respondent were not benefiting from the finance, and only few of them were receiving loan as a financing. The finding shows that those receiving the Finance from Commercial Banks most of them received loan, and on the impact of the finance they receive was of no interest and can be used to buy input and output material such as rope, seeds, tools and

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equipment, branding material and packaging materials. However the finding of the study shows that the condition required by the Commercial Banks for the seaweed producers was to be in cluster rather than individual and number of years in seaweed industry, income generated per month, quantity of production. Also on the finance control that are provided by Commercial Banks education was given. The finding of this study shows that many seaweed producers are not benefiting with the Government Finance through Commercial Banks despite the follow up the made, and others are not aware of the services if they are available.

*Keywords: Finance; seaweed production; commercial banks.*

## 1. INTRODUCTION

Seaweed production is the way of cultivating and harvesting seaweed. In its simple form, it includes the management of naturally found batches. In its most advanced form, it consists of fully controlling the life cycle of the algae. The demand on seaweed necessitates the growth of alternate resources to produce important commodities such as food, feed, cosmetics, and pharmaceuticals increase [1,2]. Large-scale seaweed aquaculture has the potential to be a key component of Europe's efforts to satisfy future resource demands, but it must be developed in a way that doesn't depend on exploiting and valuing already-existing marine resources.

Large-scale cultivation of seaweeds has been practiced in Asia for decades [3], but has only recently been a commercial activity in Europe [4]. High demand has driven a rapid expansion in Asia in this form of aquaculture. Global production has increased at a rate of 7.6% year between 2004 and 2015 when an estimated 28.1 million tons were produced [5].

According to Sea Green there are sources of financing and credit arrangements available at the national, regional and international level for aquaculture development programmers and investments into commercial production [6-8].

National financing institutions including Commercial Banks exist in all countries to foster agricultural, industrial and general economic development, and it is expected that funds required for investments in aquaculture production programmers would also be forthcoming from this source [9,10].

In Kenya, in the year 2016 seaweed farmers in Kibuyuni were encouraged to manufacture seaweed soap, with training in the production of seaweed soap, body cream and foods such as jam, juice and salad [5]. FAO also trained the farmers on best business management practices,

such as agronomy, harvesting, handling and marketing [11]. The seaweed farmers' group also collaborated with the Kenyan Industrial Research and Development Institute and other organizations to develop a variety of other cosmetic and food products, reduce post-harvest losses, and implement other aspects of best management practices [12]. With a growing interest in seaweed farming from a variety of stakeholders and the socioeconomic benefits for local communities demonstrated [13,14], the Kenyan government recognized this industry as one of the priority interventions under the Blue Economy Initiative (Blue Economy Committee Report 2016-unpubl.). In Tanzania, Approximately 428 seaweed species of Rhodophyta, Chlorophyta and Phaeophyceae have been recorded [15]. Amongst these, only a relatively small number of species are used for commercial cultivation, including the red seaweeds *Euclima* and *Kappaphycus* which are farmed in Tanzania among other countries, contain the phycocolloid carrageenan that is extracted and used in such industries. Three species of *Euclima* are found growing naturally in Tanzania, *E.denticulatum* (commercial name 'Spinosum'), *E. Platycladum* and *E. okamurai*, and one species of *Kappaphycus*, *K. striatus* (commercial name 'Cottonii') [15,16].

The Tanzanian seaweed industry employs about 30,000-36,000 of which 25,000 in Zanzibar and 5,000-6,000 in Tanzania most of whom are women who contribute significantly to the country Economic especially of the Island of Zanzibar according to 2011 statistics.

Seaweed production in Tanzania has increased rapidly since the start of the industry in 1989, particularly in Zanzibar, which is comprised of two islands, Pemba and Unguja [17-20]. Production increased from 8080 t in 1989 to the 107,000 t in 2015, with a maximum production of 176,000 t recorded in 2016. Since 2016, however, production of *Kappaphycus* has

declined significantly as a result of disease, such as ice-ice disease syndrome, and epiphyte outbreaks that have been exacerbated by increasing surface seawater temperatures linked to climate change [21,22].

The main technique of farming seaweeds in Tanzania is the off-bottom (peg and line), which is typically used in shallow waters (< 1 m at low tides). In this technique, seaweed seedlings of about 100–200 g are tied to nylon ropes (lines) using thinner ropes of the same material, known as “tie-tie”. The principal lines are then strung between two solidly embedded wooden pegs in the seabed. The lengths of the lines vary based on the location (such as if the area is prone to powerful waves) or the physical strength of the farmer; generally speaking, men farmers employ longer lines than female farmers. The distance between the seedlings is approximately 20–30 cm. This method is simple to utilize because it enables farmers to operate during the low tide period (Msuya 2011b).

However, in recent years, training programs have been launched by the government, the private sector, and other stakeholders to teach farmers how to manage their farms, particularly in connection to reducing the danger of pest and disease outbreaks (Rusekwa et al. 2020). Seaweed species that are farmed in Zanzibar are *Eucheuma denticulatum* and *Kappaphycus alvarezii*. The current annual production is 4, 000 tons dry weight from approximately 500 ha, which is much less than other areas such as Chile where the production is 74, 000 – 322, 000 tons per year for red and brown seaweeds (Buschmann et al. 2001). More than 25, 000 people are involved in seaweed farming on the Zanzibar Islands.

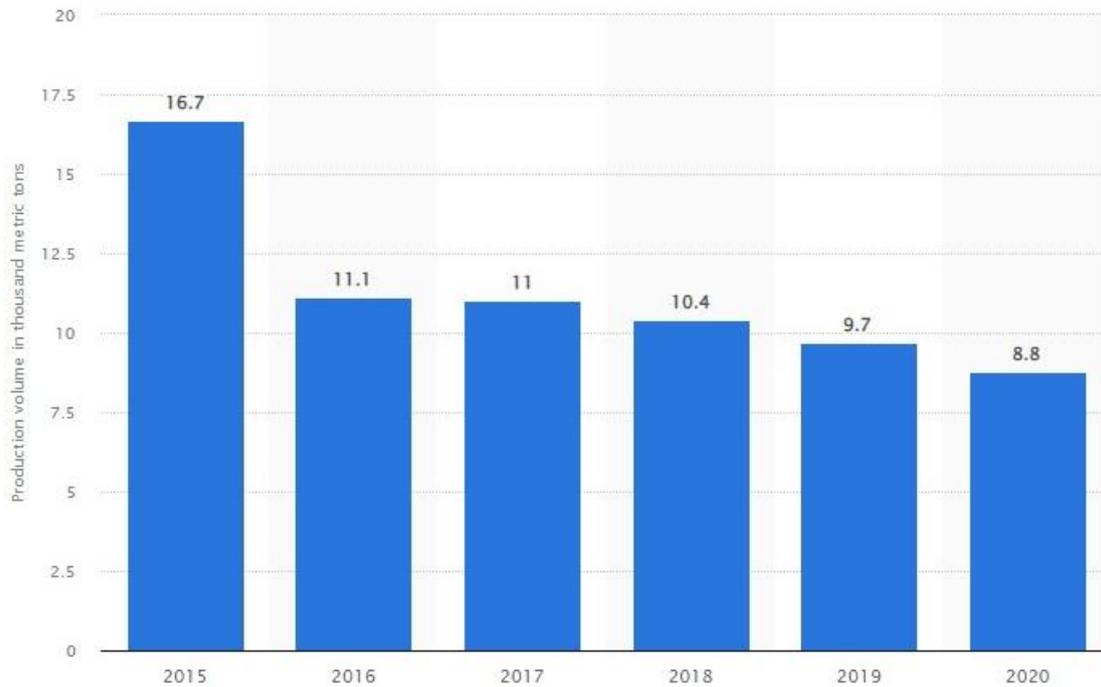
The seaweed farming industry contributes significantly to the economy of Zanzibar. For example, in 1993 seaweed farming contributed 14.7 % of Zanzibar exports, where as in 1994, it contributed 27.3 % [23].

In order to cultivate seaweed, narrow nylon stripes known as “tie-ties” are used to fasten seedlings to 3–5 m long nylon ropes. Then, the ropes are fastened to wooden pegs that had been embedded in the sand. To prevent overexposure to the sun and precipitation, which could result in diseases associated to stress and bleaching, seaweed must be submerged at low tides. On Pemba Island and the mainland of Tanzania, longlines or floating techniques are also employed [23]. Additionally, the usage of

floating rafts was suggested as a workable technique for seaweed cultivation in Tanzania [24,23]. However, the government of Zanzibar has acknowledged the additional value of processing the raw materials nationally and is encouraging the growth of an indigenous seaweed processing sector to create its own supply of carrageenan for both domestic consumption and export. This initiative is a result of numerous governmental and ministerial committees that were entrusted with advising the government of Zanzibar on how it may develop its seaweed sector. Also financial institution (Commercial Banks) in Zanzibar need to support the seaweed industry together with the help of the Revolutionary Government of Zanzibar to provide financial support to seaweed producers in order to develop the seaweed industry to another level. However generally in Tanzania there are 48 license Banks where 36 are Commercial Banks (BOT, 2022). The Commercial Banks however has many function some of which are reduce risk through coverage, diversification, and commerce, reduce the cost of compiling the information needed to enforce contract, compile information and allocation of the resources by reducing information asymmetry between lenders and borrowers.

But recently The Government of Zanzibar through ZIPA (Zanzibar Investment Promotion Authority) and ZAFREZA (Zanzibar Free Zone Economic Zone Authority) has liberate the economy and new Conducive business environment and lucrative opportunities that have ensure and necessitate the creation of specific state organs to promote, handle and oversee investment on seaweed. In order to ensure the business environment for seaweed between farmers, investors and buyer TBS (Tanzania Bureau of Standard) has provide a guideline to stakeholder and investors on the requirement of quality and Grade of Seaweed which are in Production volume of seaweed in Zanzibar from 2015 to 2020.

According to Julia Faria; the production of seaweed in Zanzibar decreased to 8.8 thousand metric tons in 2020, keeping a downward trend. In the previous year, the semi-autonomous region of Tanzania produced 10.4 thousand metric tons of the crop. Seaweed farming is an important activity in the Tanzanian archipelago, being a key player in the region's exports. However, the production level has been decreasing in recent years, mainly due to increasing ocean temperatures.



**Fig. 1. Seaweed cultivation from 2015 to 2020**

### 1.1 Statement of the Problem

Seaweed farming, is an important economic activity in both Unguja and Pemba Islands (Msuya, 2006), [25]. Seaweed farming, has helped to improve the economic conditions of farmers most of them women [26]. In addition, participation of households in seaweed farming has been seen to elevate their status in their villages, create employment opportunities and decrease rural urban migration [25]. Despite its contribution to community livelihood, the practice faces a number of challenges such as small farm sizes, strong winds, lack of transparency in the pricing structure poor quality, low production volume, lack of sufficient fund, poor marketing and world market preference for one seaweed species. However according to the organization fisheries advisors “Farmers in Zanzibar Community will receive a comprehensive training so that they can increase the quality and quantity of their production yield, better site designation, market identification and financial literacy training such as where to have an access of different source of funds, how to utilize the availability of source of funds [27-30]. Also different Government unit and stake holders together with Commercial Banks, are trying to help seaweed farmers by providing possible alternatives and strategies to the seaweed farming business like financing support, means to increase the quality

and quantity of the seaweed being produced. One such alternative is through providing financial support, financial controlling techniques, innovation that adds value to seaweed that is being produced. However in Zanzibar there is tremendous efforts have been made by the government, like allowing free trade within the seaweed industry on the island [31]. Also, research institutes and NGO’s have been making innovations to increase seaweed production where such innovation requires huge financial support.

Therefore due to the lacking of many studies regarding Government Financing through Commercial Banks that support seaweed production in increasing and improving the seaweed being produced, the aim of this study is to fill in the Gap on the understanding on how the Government Finance through Commercial Banks can assist in helping seaweed production in Zanzibar through examining the theoretical and empirical evidence on the assessment of Impact of Government Finance through Commercial on seaweed production. Zanzibar will be used as the Case study and being one among the unique study to be conducted in Zanzibar.

### 2. LITERATURE REVIEW

This part discussed the theories and empirical review that support the study of Government

Financing through Commercial Banks to Seaweed Producers. Transformation Theory and Aquaculture 4.0: New Era of Seaweed Cultivation are used in this study. Empirical studies used are as follows;

Georgia de Jong Cleyndert [32]: Adaptation of Seaweed Farmers in Zanzibar to the Impacts of Climate Change Seaweed The result of the study shows that due to the climate it affect the productivity of the seaweed such as increase in temperature and affect the quality of the seaweed being produced.

Anes Dwi Jayanti [33], Technical and Economic Aspects to Increase the Income of Seaweed Farmers The result of this study shows that due the lack of improper production facilities, falling in price, low capital leads to the low income of the seaweed famers, therefore in-order to increase the income of the seaweed farmers it is an important for the farmers to have an assistance in financial support.

Hari Wahyono, Januar Kustiandi, Tri Wahyu Hardaningrum [34], Welfare Meaning and Its Influence on Business and Finance Management of Seaweed Farmers The result of the study aims to examine in depth the variation of subjectivity in interpretation welfare and how it affects the strategy and business and financial management processes seaweed farmers.

Flower E. Msuya & Anicia Q. Hurtado [35] the role of women in seaweed aquaculture in the western Indian Ocean and South East Asia. This result of this study shows that many women who participate in seaweed farming improve their financial skills or financial management for more secure livelihood which in return ensure the increase in productivity through improving in marketing access.

B. A. Songwe<sup>1</sup>, S. M. Khamis, M. H. Khalfan, and F. E. Msuya [36], Commercial Seaweed Farming in Zanzibar Coastal Villages: Potential for Innovative and Competitive Economic Growth” The result of this study shows that due to lack of financial support farmers are unable to improving the crop commercial aspect, poor economic return, low level of value addition initiatives on seaweed farming.

Moh'd Said Seif [37], The Impact of Seaweed Farming on Household Income. The result of this study shows that seaweed farmers despite requiring to have support in finance but however

they need other support like education this leads to the improvement of seaweed being produced (quality).

Riziki Said Seif [38], The Influence of Price on Seaweed Farming Growth. This study show that many farmers are facing many challenges such as disease, increase I investment for tourist, lack of basic farm input for the production of seaweed lack of knowledge for a competitive price, therefore, there is a need for seaweed producer to have an assistance in getting the production input to enhance seaweed production, assistance in knowledge of disease that also may affect the production of seaweed.

Many studies have been done regarding seaweed farming and seaweed production around the world. The reviewed studies shows different thing in relation to seaweed production and farming, such as impact of seaweed on house hold income, price influence on seaweed, commercial seaweed farming, value chain analysis. But many studies failed to show how seaweed production can be financed to increase the output (quantity) and improve quality which both aspect could lead to positive outcome from different studies that have been done regarding seaweed. Therefore this study currently address the research gap that was found in literature review.

### 3. METHODOLOGY

This study was carried out in Zanzibar (Unguja and Pemba). The study population was seaweed producers in Zanzibar which is 32,000. The sample size of the study was 100 respondents who were selected as the sample for the study which were seaweed producers. In this study, the researcher used simple random sampling techniques due to their accuracy and flexibility. The researcher used the simple random sampling procedure to sample 100 seaweed producers through questionnaire. The study used primary data. The researcher used questionnaire to get information from seaweed producers on the Government Finance through Commercial Banks. Descriptive statistics used to analyze quantitative data in the form frequency distribution.

### 4. RESULTS AND DISCUSION

Base on the method used the researcher found that there are many finance provided by

**Table 1. Finance provided by government through commercial banks to seaweed producers**

		Frequency	Percent
<b>Valid</b>	Yes	9	9.0
	No	91	91.0
<b>Total</b>		<b>100</b>	<b>100.0</b>

Source: Field work (2022)

**Table 2. Accessibility of Input due to finance provided by government through commercial banks to seaweed producers**

		Frequency	Percent
<b>Valid</b>	Yes	9	9.0
	Neutral	91	91.0
<b>Total</b>		<b>100</b>	<b>100.0</b>

Source: Field work (2022)

**Table 3. Condition required by commercial banks to seaweed producers**

		Frequency	Percent
<b>Valid</b>	Seaweed Cluster	9	9.0
	Neutral	91	91.0
<b>Total</b>		<b>100</b>	<b>100.0</b>

Source: Field work (2022)

**Table 4. Availability of finance control provided by commercial banks to seaweed producers**

		Frequency	Percent
<b>Valid</b>	Yes	7	7.0
	No	2	2.0
<b>Neutral</b>		91	91.0
<b>Total</b>		<b>100</b>	<b>100.0</b>

Source: Field work (2022)

Government through Commercial Banks to seaweed producers. This is shown in Table 1 that 91% of the respondent do not benefit from the finance and only 9% benefited from the Finance provided by Government through Commercial Banks.

Moreover on the Impact of Finance provided by Government through Commercial Banks, the researcher found that only 9% of the respondent uses the Finance to have an access of input materials such as seedling, ropes, tie ties, tools and equipment's and output materials such as packaging, branding. And the Finance cannot be used to finance expatriates, better storage facility and employ number of human resources to increase production of seaweed.

The Table 3 shows the condition required by Commercial Banks to seaweed producers, where 9% of the respondent shows that the condition was to be in cluster rather than individual and the remaining 91% were neutral. However other

condition were number of years in seaweed industry, production volume, selling quantity (volume) and income generated per month.

On the side of the financial control provided by Commercial Banks to seaweed producers Table 4 shows the Finance Controls such as education on the types of Finance and training on the utilization of the finance are provided, however only 7% received such finance control, 2% did not receive and the remaining 91% were neutral.

## 5. CONCLUSION

Seaweed producers in Zanzibar uses their internal finance to finance their production process, however they are in need of external finance, the Finance they mostly prefer is loan, but however hire purchase loan is considered to be suitable finance to them because during data collection one respondent said there are boat which were given to them as loan by seaweed corporates and they succeed in paying of the

debt. But however many of the respondent were not aware of the loan and their terms because some of them think that the loans that are provided by Commercial Banks are with interest and base on the Religion of Zanzibaris interest is prohibited and its haram.

However at the time like in Zanzibar which is a Blue Economy Era it is important for the Government to put more effort in helping seaweed producers, because in seaweed industry it not only about producing seaweed and selling but it's about taking seaweed into another level of production where on the other side it help in attracting tourism where in return add value in tourism as well. Therefore it is important for the Revolution Government of Zanzibar to seat down with the Commercial Banks in Zanzibar to provide finance to seaweed producers at a shorter period of time with few condition and enhance them to take the finance, support Commercial Banks on opening more branches in different region within Zanzibar. However The Revolution Government of Zanzibar shall monitor and set the price of Seaweed, ensure the targeted population are aware of the financial support.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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