REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

THE PINEAPPLE VALUE CHAIN IN MUXÚNGUE AND ITS IMPACT ON THE SOCIOECONOMIC DEVELOPMENT OF MOZAMBIQUE

A CADEIA DE VALOR DO ABACAXI EM MUXÚNGUE E SEU IMPACTO NO DESENVOLVIMENTO SOCIOECONÔMICO DE MOÇAMBIQUE

LA CADENA DE VALOR DE LA PIÑA EN MUXÚNGUE Y SU IMPACTO EN EL DESARROLLO SOCIOECONÓMICO DE MOZAMBIQUE

Mateus Jacobe
Mestre em Ambiente e Desenvolvimento Sustentável das Comunidades (UniSave), IMSI, Moçambique
E-mail:mateusjacob6@gmail.com
https://orcid.org/0009-0006-5510-1003

Manuel Simão NHACUTOE
Graduado em Ensino de Física com Habilitações em Matemática (UP-Massinga),
Email: manuelinhacutoe902@gmail.com

Abstract
This study focuses on mapping the pineapple value chain, assessing the agro-ecosystem managed by the rural communities of Muxúngue, in the District of Chibabava, Sofala province. The research included a sample of 60 pineapple producers, selected by non probabilistic sampling, using snowball techniques. Questionnaires, interviews and direct observation were applied, as well as the use of the Value Link tool to map pineapple production and marketing activities. The results indicated that the producers obtain seedlings from the community itself, using money or products to exchange. Planting is simple, with seedlings arranged in rows, maintaining soil sustainability by accumulating the remains of other crops between the rows. Pineapples are sold both wholesale and retail, to different customers who travel along the N1 in the central region of the country. Average annual production in the region is around 80,000 tons. The study highlights the importance of the pineapple value chain for the local economy and offers valuable insights for improving the agricultural management of the fruit.

Keywords— Agroecosystems; Pineapple cultivation; Production chain; Community Businesses; Rural development.

Resumo
Este estudo concentra-se no mapeamento da cadeia de valor do abacaxi, avaliando o agroecossistema gerenciado pelas comunidades rurais de Muxúngue, no distrito de Chibabava, província de Sofala. A pesquisa incluiu uma amostra de 60 produtores de abacaxi, selecionados por amostragem não probabilística, utilizando a técnica de bola de neve. Foram aplicados questionários, entrevistas e observação direta, bem como a ferramenta Value Link para mapear as atividades de produção e comercialização do abacaxi. Os resultados indicaram que os produtores obtêm mudas na própria comunidade, utilizando dinheiro ou produtos para troca. O plantio é simples, com as mudas dispostas em fileiras, mantendo a sustentabilidade do solo através do acúmulo de restos de outras culturas entre as fileiras. Os abacaxis são vendidos tanto no atacado quanto no varejo, para diferentes clientes que transitam pela N1 na região central do país. A produção média anual na

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

região é de cerca de 80.000 toneladas. O estudo destaca a importância da cadeia de valor do abacaxi para a economia local e oferece informações valiosas para o aprimoramento da gestão agrícola da fruta.

Palavras-chave: Agroecossistemas; Cultivo de abacaxi; Cadeia produtiva, Empreendimentos comunitários, Desenvolvimento rural.

Resumen
Este estudio se centra en el mapeo de la cadena de valor de la piña, evaluando el agroecosistema gestionado por las comunidades rurales de Muxúngue, en el distrito de Chibabava, provincia de Sofala. La investigación incluyó una muestra de 60 productores de piña, seleccionados mediante muestreo no probabilístico, utilizando la técnica de bola de nieve. Se aplicaron cuestionarios, entrevistas y observación directa, así como la herramienta Value Link para mapear las actividades de producción y comercialización de la piña. Los resultados indicaron que los productores obtienen las plántulas de la propia comunidad, mediante intercambio de dinero o productos. La siembra es sencilla, con las plántulas dispuestas en hileras, manteniendo la sostenibilidad del suelo mediante la acumulación de restos de otros cultivos entre las hileras. Las piñas se venden tanto al por mayor como al por menor, a diferentes clientes que transitan por la carretera N1 en la región central del país. La producción anual promedio en la región ronda las 80.000 toneladas. El estudio destaca la importancia de la cadena de valor de la piña para la economía local y ofrece información valiosa para mejorar la gestión agrícola de este cultivo.

Palabras clave: Agroecosistemas; Cultivo de piña; Cadena de producción; Empresas comunitárias; Desarrollo rural.

I. INTRODUCTION

In developing countries, family farming is crucial to the livelihoods of communities, and in Mozambique, this sector dominates, employing 80% of the working population, 6% of whom are women. The main agricultural exports include cotton, pineapple, cashew nuts, sugarcane, tobacco, and tea. However, there is a lack of communication between unlicensed farmers in different regions of the country. The district of Chibabava, specifically the administrative post of Muxúngue, has arable soils that favor agricultural practices, serving as an important source of income. Peasants supply local markets with their products, both wholesale and retail, contributing significantly to the regional economy (Mandeia, 2013).

The pineapple value chain, addressed in this research, involves several stages that reflect the improvement of the production process. These stages include components that require systematization and institutional coordination between partner organizations, aiming to assist in the implementation of public policies that promote the desired sustainable development (Moore, 2007).

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

In terms of production and the value chain, considering the environmental factor, the dissemination of pineapple differs significantly from other crops because it is a perennial plant that is not commercially propagated by seeds. This generates greater interaction among producers in the search for and local marketing of pineapple seedlings, strengthening the community's social capital and ensuring better production in the agricultural harvest. In addition, aspects such as harvesting, distribution, and marketing at strategic points, which ensure greater product output, play a crucial role in the success of the pineapple value chain (Reinhardt et al., 2000).

Pineapple production and marketing in the region are part of a complex agroecosystem due to the diversity of actors involved in the value chain, who come from different communities and neighboring cities. This diversity directly influences the functioning of the chain, promoting greater interaction among producers, which in turn strengthens local social capital. This social capital is used to boost production, either through access to credit services available in communities or through greater efficiency with which producers operate in markets (Putnam, 1996).

Considering the importance of these studies for the socioeconomic development of rural communities and the Mozambican population, this study aimed to assess the impact of the pineapple value chain on the socioeconomic development of the communities of Muxúngue. The study involved identifying and characterizing the main socioeconomic impacts of this value chain, with the purpose of mapping the pineapple production process in central Mozambique. The starting point was the hypothesis that the pineapple value chain in Muxúngue adopts sustainable management practices that ensure self-control and sustainability for the families involved. The ultimate goal is to propose management strategies and public policies that improve the efficiency of this value chain, minimizing the threats associated with human activities and climate change.

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

II. Material and Methods

Muxúngue is located in Mozambique in the province of Sofala in the district of Chibabava and in the administrative post of Muxúngue, situated along national road number 1, in the southern part of the district of Chibabava .

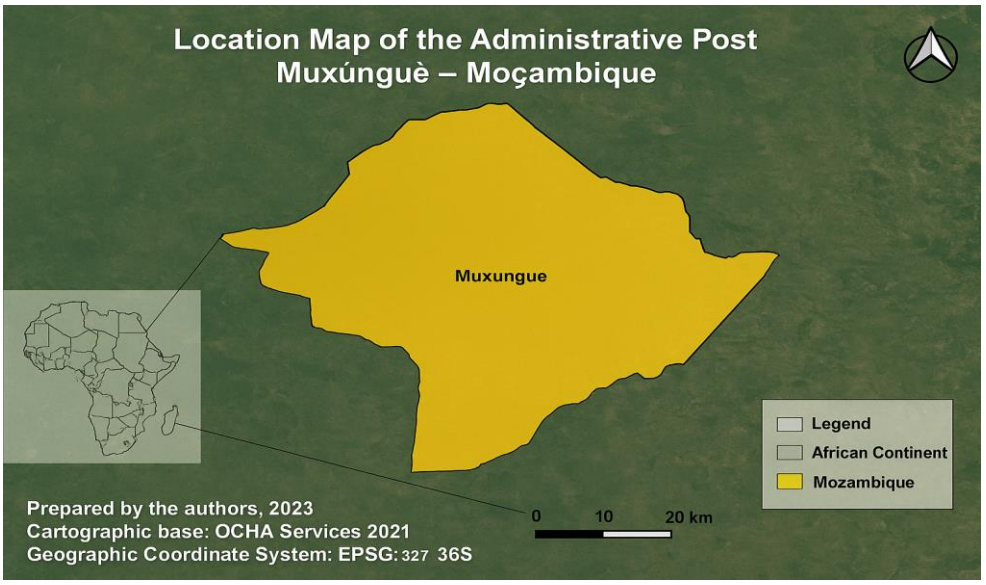

Figure 1- Map of the geographical location of Muxúngue

The study was conducted in areas of the Muxúngue administrative post, in the regions of Mangomonhe, Pandja, and Matindiri, all located on the right bank of the N1 highway. From the village of Muxúngue, we traveled about 5 km to the first pineapple cultivation areas, with the research extending approximately 30 km to the limits of the district of Búzi.

The research used a qualitative approach, considered appropriate for this study as it allows direct contact with the environment and the object of research, as suggested by Prodanov and Freitas (2013). The method adopted was Multiple Case Study (Yin, 2015), focusing on a deep immersion in family farms, enabling a detailed analysis of production systems.

Techniques and instruments were used for data collection, with emphasis on interviews, one of the main research instruments. This approach allowed direct interaction with participants, enabling the collection of detailed information on the topic under study and facilitating understanding of the social and productive system.

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

The questionnaire was another important instrument, serving as a link between the researcher and the producers.. In addition, the Value Links 2.0 model was used, which compiles action-oriented methods to promote economic development with social inclusion, applied to family farming within the value chain perspective (Santos et al., 2008).

The study population consisted of pineapple producers, totaling a sample of 60 participants. The selection of farmers followed the snowball sampling method and was completed when the responses began to repeat themselves. To preserve the identity of the interviewees, codes such as PA1, PA2, etc., were used for pineapple producers.

III. RESULTS AND DISCUSSION

3.1 History of pineapple production in Muxúngue

According to information provided by one of the main pineapple producers in the region, production of the Smooth Cayenne and Pérola varieties in Muxúngue began in 1964 and 1965, when a worker from the Companhia do Búzi brought some seedlings to his farm (verbal information). Before the introduction of these varieties, others, such as Singapore Spanish, were grown on a smaller scale, mainly for family consumption. From 2000 onwards, pineapple cultivation began to be marketed in larger quantities, serving passengers passing through the village of Muxúngue. This marked the beginning of large-scale production, focusing on local trade and nearby cities such as Chimoio and Beira.

However, pineapple production in the region has fluctuated significantly, influenced by factors such as drought, reduced buyer demand, and political and military instability. Figure 2 illustrates the graph of pineapple production levels in Muxúngue between 2016 and 2020, highlighting these fluctuations.

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

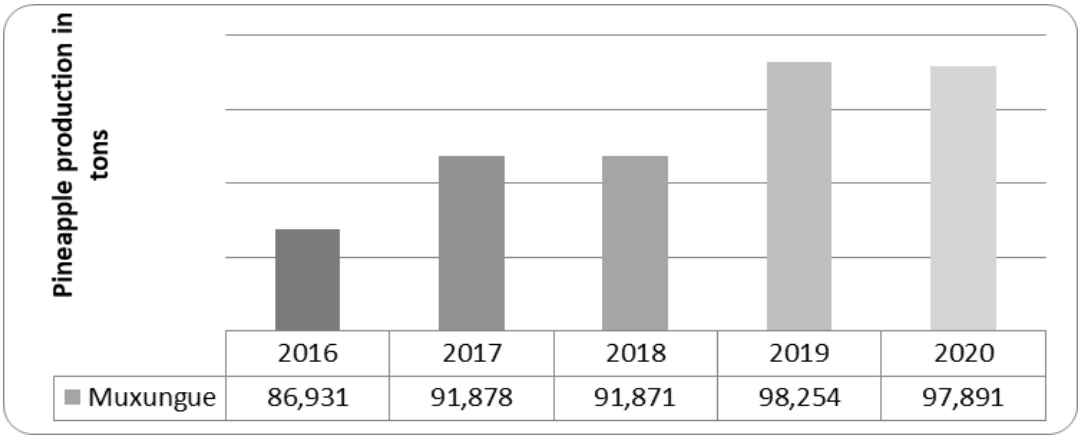

Figure 2: Graph of pineapple production levels in Muxúngue for the Srnooth Cayenne and Pérola varieties. Source: SDAE-Chibabava (2021)

This region has seen steady growth, except in 2020, when there was a slight decline due to factors such as the COVID-19 pandemic, which reduced the flow of people in the region, directly impacting production compared to the previous year, 2019. Although pineapple production and quality have increased, there are no companies interested in using this raw material to manufacture juices or yogurts. Local authorities confirm that the pineapple produced in Muxúngue is of excellent quality, but regret the absence of agents who buy large quantities for commercialization or processing. This scenario is similar to that described by Mandeia (2013), who highlighted the high quality of local pineapple, but without an adequate market, resulting in fruit rotting on the streets of the village.

These results also corroborate the observations of Petersen et al. (2017), who state that agroecosystems function dynamically, with interactions between their components coordinated by economic-ecological flows, mainly driven by the work of the General Center for Agroecosystem Management (NSGA). Figure 3 illustrates the flow of different products associated with the pineapple value chain in this region, forming the preferred agroecosystem of families in this region, which has been contributing to their livelihoods.

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

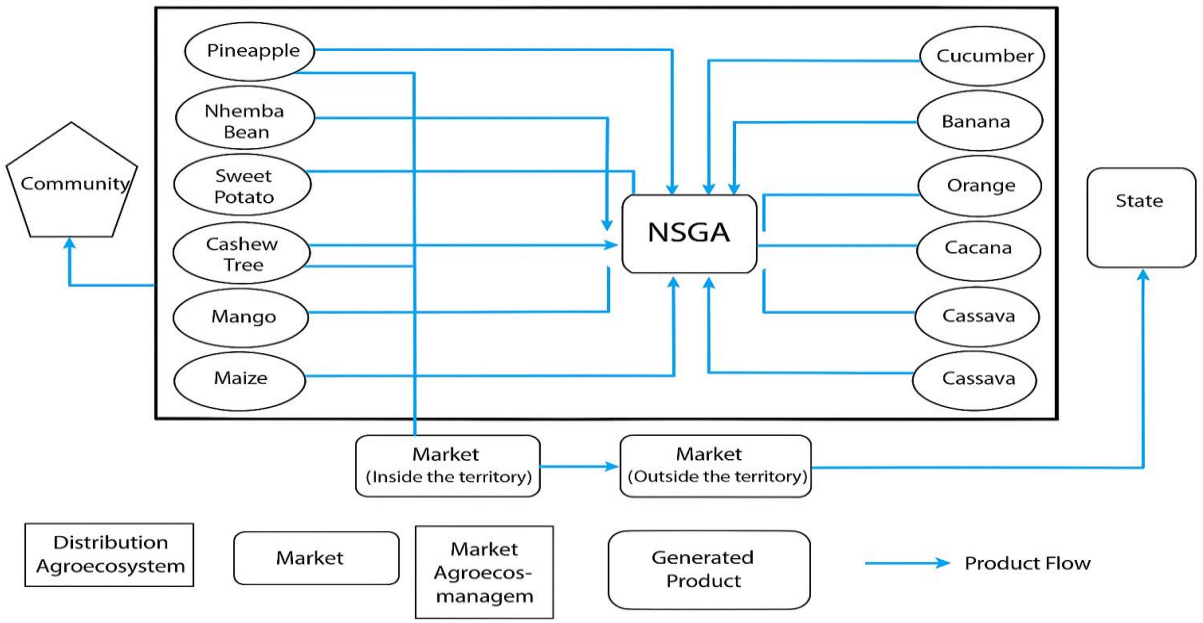

Figure 3: Flowchart of agroecosystems associated with pineapple production in Muxungue in 2021, source: author (2021) adapted from Siqueira (2018)

Pineapples are sold both within the territory, in agricultural areas, and outside, in the village's conventional market. Ripe fruits are sold in the village center, mainly by wholesalers and retailers, usually in bunches. In addition to pineapple, other products such as cashew nuts, cucumbers, mangoes, bananas, sweet potatoes, and cassava are also sold at weekly markets in the Muxúngue region and nearby locations, such as Chissinguana (Búzi) (oral information).

In terms of production, it is observed that farming families are heavily dependent on trade. The economic and ecological reproduction of agroecosystems is sustained by the mobilization and transformation of resources in each production cycle. These families achieve autonomy through financial resources, which enable them to purchase the necessary inputs. Ecological and social resources are obtained in the form of goods, through buying and selling relationships, including credit. This dependence is evident in the various stages of the pineapple value chain, such as clearing and cleaning the land, acquiring seedlings, planting, maintenance, harvesting, and distribution of production.

3.2 Agroecological activities associated with pineapple production in Muxúngue

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

3.2.1 Opening up agroecosystem spaces

According to PA5's testimony, land acquisition for agricultural purposes in Muxúngue occurs in two ways: some farmers inherit their land from their ancestors, while others purchase land from community authorities, using domestic animals such as chickens or goats, or even monetary values. It is important to note that members of the Mugadui tribe, as they are considered the “owners” of Muxúngue, do not need to acquire land, as they already have rights to it. Despite the practice of buying and selling land, the Land Law (Law No. 19/97, Article 3) establishes that “land is the property of the State and cannot be sold, alienated, mortgaged, or pledged.” Thus, these transactions violate the principles of current legislation.

Agricultural land is generally cleared between May and August, when the vegetation begins to dry out and the grass recedes, facilitating the clearing process. During this period, the ripening of cowpeas, which cause skin irritation, is also avoided. Clearing one hectare costs between US$39 and US$40, and the work is done with long-handled hoes, usually by the family. If additional labor is needed, the cost per measured portion is US$15. The process involves cutting down large bushes and trees, which are broken into smaller pieces and then burned.

Figure 4—Opening up agricultural land

3.2.2 Pineapple seedlings

In Muxúngue, pineapple seedlings are planted using different types of shoots: crown (sprouting from the top of the fruit), baby plant (sprouting from the peduncle, the stem that supports the fruit), baby shoot (sprouting from the region

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

where the peduncle attaches to the stem), and shoot (sprouting from the stem). According to Reinhardt et al. (2009), each type of seedling has specific characteristics that can be advantageous or disadvantageous, and these must be considered when choosing and managing planting material. These characteristics influence the growth and development of pineapple seedlings, facilitating their cultivation.

Figure 5 - Pineapple seedlings of the Srnooth Cayenne variety

Muxúngue producers prefer to use seedlings from side shoots rather than from the crown, due to the lower availability of crown seedlings, which generally remain on the fruit sold in fresh fruit markets. In addition, crown seedlings are less vigorous, have a longer growing cycle, and are more susceptible to disease, especially black rot (Chalara paradoxa). In contrast, shoot seedlings are more uniform in size and weight, resulting in plantings with more homogeneous plant size and development (Souza, 2000).

According to Souza (2000), crown seedlings take two to three years to begin bearing fruit. On the other hand, Muxúngue producers more often opt for shoot seedlings, which have an intermediate cycle, less uniform than crowns but more uniform than suckers. These seedlings are easy to harvest and widely available, especially in the Pérola variety. In addition, shoot seedlings are preferred because of their greater vigor and shorter cycle, often taking only a year and six months to produce fruit. They are highly sought after by customers who want to plant for sale or family consumption. This recommendation is not strict, as planting can be done

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

throughout the year, depending on soil moisture, seedling availability, and the desired time for fruit harvest.

3.2.3 SPACING BETWEEN ROWS DISTANCE

The between pineapple plants can vary based on the variety, the destination of the production, the level of mechanization, and other factors. For the production of fresh fruit or juice, closer spacing is recommended, resulting in fruit weighing between 1.1 and 1.5 kg. In contrast, for industrial production, wider spacing (fewer plants per area) should be used, resulting in fruit weighing more than 1.5 kg.

Planting density per unit area is one of the most important factors for pineapple production, directly influencing yield and production costs (Cunha et al., 1999). More densely planted fields tend to provide higher production per area, but with smaller fruits. In this case, single rows were used, and the spacing between plants was measured with the length of a hoe handle. Some practices do not use rows, making only simple throws for planting. For those who adopt rows, the spacing is 1.0 m x 50 cm, using a hoe handle approximately one meter long to measure distances.

Figure 6—Spacing of pineapple seedlings in Muxúngue

According to PA6, in the spaces between rows as a sustainability technique, producers who do not burn crop residues place them in small piles to enrich the soil for the next growing season. This action means that those who adopt it have larger

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

pineapples than those who do not use this technique, which is considered valid for obtaining better quality pineapples.

3.2.4 Sacha in agroecosystems

The crop is kept free of weeds or is constantly maintained to combat weed growth. Weed control can be done by manual weeding (hoeing), and pineapple producers in Muxúngue use long-handled hoes.

In areas affected by weeds that are difficult to control, producers attack them in a way that does not endanger the growth of existing crops, since allowing these weeds to grow can attract pests that endanger the growth of pineapples.

Speaking of pests, in pineapple fields, PA8 stated that goats should not be allowed to enter, especially during the dry season, as these animals eat the leaves and roots of pineapple plants, and when the leaves are eaten, the pineapple plant practically dies.

Figure 7 - Producers harvesting in Muxúngue

3.2.3 Pineapple harvest

At harvest time, the producer must protect their hands with thick canvas gloves. The producer holds the fruit by the crown with one hand and cuts the stalk three to five centimeters below the base of the fruit, so that only two to four shoots from the cluster of suckers are taken to serve as natural packaging for the fruit, with the remaining shoots remaining on the plant for use as planting material. Fruits

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

destined for nearby markets or industry, which are less susceptible to rot, can be harvested (broken) without the suckers.

3.2.5 Transportation of pineapples

[…] After harvesting, the fruits intended for sale are transported using basins, bicycles, motorcycles, and cars (Figure 8) of different tonnages to the village of Muxúngue, where they are distributed to different consumers, from locals to travelers. (oral information)**.**

Figure 8: Transport in using

Figure 9, Represented by letters a) and b), shows producers with pineapples that they sell wholesale early in the morning at the entrance to Pandja.

Figure 9-Wholesale pineapple sales at the entrance to Pandja a) and b)

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

One of the main problems encountered in relation to pineapple sales is the issue of managing organic waste from pineapples, as there is a noticeable lack of cleanliness in the places where pineapples are sold, since sellers say they pay a fee and the institution responsible for solid waste management does not do its job.

3.3 Mapping the pineapple value chain in Muxúngue

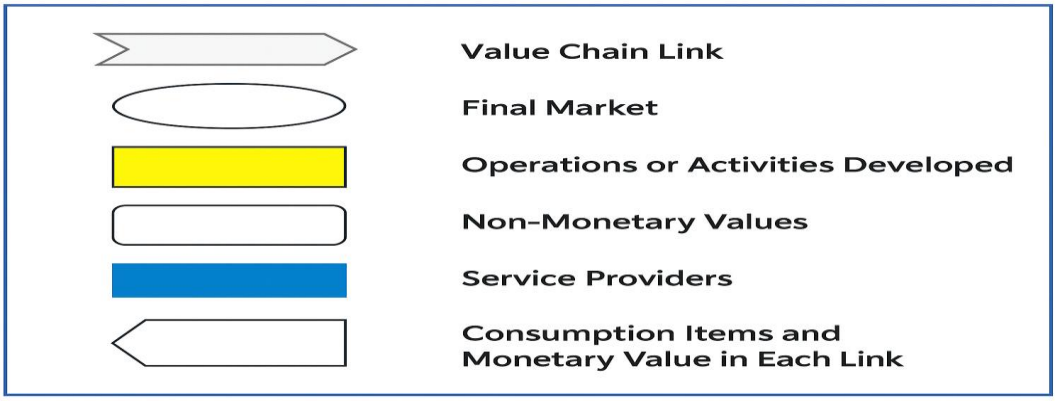

Figure 10- Value links model in the pineapple value chain mapping Source: Author (2021) adapted from Siqueira (2018)

The following figure illustrates the value chain created with the community of Muxúngue with a group of pineapple producers in a place known as Chitonguero, where communities meet to solve social problems in this region.

Figure 11- Pineapple value chain in Muxúngue in 2021

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

In the mapping model developed by Siqueira (2018), the first link in the pineapple value chain in the Muxúngue region is the clearing of land in the forests. Families discover these areas while carrying out extractive activities such as hunting, fruit gathering, and searching for firewood and wild roots. At this stage, the area is prepared for planting pineapple seedlings, beginning with the felling of trees, followed by the manual weeding of shrubs and creeping plants, and finally the clear-cutting of trees in permitted areas.

All cut plant material, such as trunks, leaves, and roots, is burned in a process known locally as “mavivhi” (pile of tree debris), which aims to clear the land and allow the ashes to be incorporated into the soil, helping with fertilization. The costs of this stage are related to hiring the labor needed to carry out the activities, which take an average of three months to complete, depending on local rainfall. This process must be carried out before the maluco beans ripen, to avoid discomfort for the workers. Family groups are the main organizations involved in this stage.

The second link in the Muxúngue pineapple value chain is the planting of seedlings in the prepared soil. This process occurs without the assistance of extension workers, as planting must be done after the soil has cooled, i.e., after a significant period of time has elapsed since the burning of the remains of trunks and branches. Another important activity in this link is obtaining pineapple seedlings, which can be produced by the producers themselves, acquired through barter, or purchased for about $0.015 each. This process takes place without supervision from extension workers, but the presence of all family members is necessary due to the spacing techniques between seedlings used in the region. Planting is carried out 20 days after fertilizing the holes.

The third productive link in the value chain refers to crop maintenance, with activities focused on controlling invasive species in cultivated areas. Management involves manual weeding, without the use of chemicals, to improve production. The labor cost for one hectare of cultivation during the research period was approximately $55.56, including the purchase of products and the necessary labor. The fourth link is the harvesting of pineapples, which begins with the selection of

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

ripe fruit. Harvesting is carried out by a group of workers, who use knives or sharp machetes to cut the ripe pineapples and organize them into piles of 30 to 40 fruits, always checking the quality.

The fifth link in the value chain is the distribution of production, which consists of transporting the fruit to the village of Muxúngue. The pineapples are tied to baskets, bicycles, motorcycles, or vehicles using a rope made from a native plant called mutondodji to ensure that the fruit does not fall during transport. The main social organizations involved are families and members of associations, when these were active. This stage has an approximate cost of $31.75, referring to the freight cost to the village of Muxúngue. And the sixth link in the pineapple value chain is the processing of the fruit, which includes the subsequent stages of processing and marketing.

IV. CONCLUSION

In the agricultural areas of Muxúngue, in addition to pineapple, producers grow a variety of products, such as corn, cashews, papaya, cassava, cucumber, cabbage, sweet potatoes, and sugarcane. These crops aim to increase income and enrich the diet of families. Pineapple seedlings are predominantly planted in single rows spaced 1 m x 0.5 m apart, using the length of a hoe handle as a measure. Other crops, such as corn and cassava cuttings, are grown between these rows, while crops such as mapira and nhemba beans are avoided due to their tendency to deplete the soil for pineapples.

Although pineapple production in Muxúngue is a national benchmark, it faces significant challenges. Production is affected by drought, a decline in buyers, political and military instability, the COVID-19 pandemic, and a lack of technical support for crop conservation. These factors have led to the waste of tons of spoiled pineapples due to the absence of a market with adequate conservation conditions and a lack of buyers for resale in supermarkets or processing companies.

The commercialization of Muxúngue pineapples occurs mainly through street vending, both in local informal markets and in conventional markets outside the

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

region. Ripe fruits are often sold in the main village, especially in the informal market known as “ruas,” where vendors offer the fruit in large quantities to a variety of customers. Sales are carried out using bowls, bicycles, and motorcycles. In the village, pineapples are sold in bowls or on bicycles, with quantities ranging from 30 to 35 fruits at prices between US$4.76 and US$5.56. At retail, pineapples are grouped in bunches of 5 to 6 fruits, with prices ranging from US$0.79 to US$1.58, depending on quality. Pineapple scraps and peels are collected by people who use them to produce alcoholic beverages, sold at prices ranging from $0.79 to $0.95 on average.

REFERENCES

ALTIERI, Miguel A.; YURJEVIC, André. Agroecology and sustainable rural development in Latin America. Agroecology and Development, v.1.1991.

CABRAL, José, Renato, S.; SOUZA, Luiz F. da S.; CUNHA, Getúlio, Augusto, P. The pineapple plant - cultivation, agroindustry, and economy. Brasília: Embrapa Communication for Technology Transfer. Embrapa, Piracicaba-SP. 1999.

CARVALHO, João A.; RAMOS, Isabel.; GONÇALVES, Raimundo. System: conceptual model of an object. Available at: <http://piano.dsi.uminho.pt/~jac/SI/zdocumentos/sistemas.pdf>. Accessed in: April 2021. CHINELATO, F. J. The art of organizing for computerization. Rio de Janeiro: LTC. 2002.

CUNHA, Getúlio Augusto P.; CABRAL, José Renato S. Taxonomy, species, cultivars, and morphology. p.15-51. In: CABRAL, José Renato Santos, SOUZA, Luis Francisco da Silva. The pineapple plant - cultivation, agroindustry, and economy. Brasília, Brasília: Embrapa Communication for Technology Transfer, 480 p. 1999. ISBN: 85-7383-059-X.

HEINZE, Andreas. S. Value Chain Analysis, Strategy and Implementation. Value Links 2.0. Manual on Sustainable Value Chain Development. GIZ. Vol (1). 2017.

MARKONI, Mariana, A.; LAKATOS, Eva, M. Fundamentals of Scientific Methodologies, 7th Edition. São Paulo: Atlas. 2010.

MOORE, Mark.H. Text: Creating public value through public-private partnerships. Public Service Magazine. Brasilia. 2007.

PETERSEN, Paulo.; SILVEIRA, Luciano. M.; FERNANDES, Gabriel. B.; ALMEIDA, Silvio. G. Method of Economic-Ecological Analysis of Agroecosystems. 1st ed. AS-PTA, Rio de Janeiro. 2017.

PUTNAM, Robert D. Community and Democracy: The Experience of Modern Italy. Rio de Janeiro: FGV. 1996.

REMUNOM
ISSN 2178-6925

Received: 22/10/2025 - **Accepted:** 03/11/2025
Vol: 20.01
DOI: 10.61164/text0y79
Pages: 1-17

PRODANOV, Cleber, C.; FREITAS, Ernani, C. Methodology of Scientific Work: Methods and Techniques of Research and Academic Work, 2nd Edition, Brazil. 2013.

SANTOS, Fernando. T. Strategic resilience for sustainable regional development. Portuguese Journal of Regional Studies. 2008.

SEQUEIRA, Jhassem, António, S. The açaí value chain: a systemic strategy for the conservation of Amazonian agroecosystems in the municipality of Carauari-AM, Manaus. PPG-CASA, 2018.

TUAN, Yi. F. Topophilia: a study of the perception, attitudes, and values of the environment. São Paulo, SP: Difel. 2015.

VANDERMEER, John, H. The Ecology of Intercropping. Cambridge: Cambridge Univ. Press. 1989.

WARDLE, , David. A. Communities and Ecosystems: Linking the Aboveground and Belowground Components. Princeton, NJ, Princeton University Press, 2002.

YIN, Robert K. Case Study: Planning and Methods. 5th ed. Porto Alegre: Bookman. 2015.

https://www.jornalnoticias.co.mz/index.php/sociedade/62736-recursos-naturaisemchibabava. Published on November 24, 2016. Accessed on November 12, 2020, at 9:30 a.m.