



ISSN 2278 – 0211 (Online)

Utilization Of Sulaiman Ali Sugarcane Waste In Kampung Blang Mancung, Ketol District Cental Aceh District

Eliyin, Ilma Fitri, Muhamad Yustisar, Salmandi Putra, Muhamad Yustisar, Syapridayani
Agribusiness Study Program, Faculty of Agriculture Universitas Gajah Putih

Abstract:

Sugarcane waste is a residue from the sugarcane milling process (*saccharum officinarum*) after it is extracted or released in the sugar refining industry so that a large number of fibrous waste products are obtained by-products known as bagasse (bagasse). Bagasse is a solid waste that is taken from the juice. This waste contains a lot of fiber and cork. Sugarcane pulp is not only used by the factory itself, but also used by paper mills as pulp or a mixture for making paper. The chemical composition of sugarcane pulp has a ash content of 3.82%, a lignin content of 22.09%, a cellulose content of 37.65%, a juice content of 1.81%, a pentosan content of 27.97%, a SiO₂ has a level of 3.01%. Sugarcane bagasse or sugarcane waste processes needed to achieve the utilization of waste are sugarcane milling, wet transportation, drying, dry transportation and storage in warehouses. Economic value and very profitable waste for sugarcane refineries can be seen from the fixed cost (FC), Variable cost/variable cost (VC), Total cost/total cost (TC), Revenue (R), Income (π), and R/C ratio.

Keywords: Utilization of Sugarcane Waste with Economic Value

1. INTRODUCTION

The agricultural sector is an important part of the community's economy, which has been relied on so far because the agricultural sector is able to provide income in overcoming the economic crisis that occurred. This is what makes the agricultural sector one of the reliable sectors and has great potential to play a role as a trigger for the recovery of the National Economy.

Sugarcane is an important plantation sector besides Rubber, Cocoa and Palm Oil. Central Aceh Regency, especially in Ketol Subdistrict, Kampung Blang Mancung is one of the producers of sugar cane. Sugarcane is one of the important commodities for making sugar which has become a necessity for industry and households. Sugar cane is processed into sugar granules or often known as brown sugar cane.

Ketol District, especially sugarcane refinery business is one type of business that has an important role in community needs, because sugarcane business is the main source of livelihood for most people and is a source of employment and income for household needs, and sugarcane commodity is a source of community income. to survive.

From the data above, it can be seen that the amount of sugarcane production / year in Central Aceh Regency tends to decrease. The cause of the decline in brown sugar cane production is sourced from a decrease in the number of areas, a decrease in the number of plantings and an inaccurate planting schedule so that the harvest is not simultaneous. For example, in 2016 sugar production reached 37,272 tons, with an area of 4,355/ha, a total planting of 4,355 ha and a total harvest of 4,659 ha, while in 2017 sugar production decreased by 34,000 tons, with an area of 4,075 ha, the number of planted 4,075 ha and a total of 4,355 ha.

Table 1.1 Planting Area, Harvest Area, Production and Number of Factories in Ketol District, Central Aceh Regency in 2019

Nama Kampung	Planting area (Ha)	Harvest Area	Production (Ton)	Number of Sugar Mills
Rejewali	795	127	1.126	9
Buter	400	176	1.408	21
Blang Mancung	871	201	1.608	16

Blang MancungBawah	846	141	1.128	18
Cangduri	430	120	960	1
Jalan Tengah	577	191	1.528	4
Genting Bulen	477	107	856	2
Simpang Empat	221	80	640	2
Kala Ketol	985	185	1.480	3
Kute Gelime	580	158	1.264	6
Pondok Balik	1.100	318	2.544	14
Selun	462	117	936	9
Jumlah	7.854	1.921	15.368	105

Source: Observation

Based on table 2 above, it can be seen that Ketol District has 12 villages that have sugarcane plantations and a sugar cane refinery which is very sufficient to produce brown sugar cane.

Based on initial observations, the authors get information that some sugarcane farmers have little difficulty in dealing with sugarcane waste. Because this waste, if not handled properly, will have an impact on the environment. That these problems can be overcome by means of how to use brown sugar cane waste, which is expected to provide more economic value for farmers and does not have an impact on the environment.

Based on the formulation of the problem above, the objectives of this research are:

This study aims to determine the utilization of sugarcane waste in the Sulaiman Ali sugarcane factory in Blang Mancung Village, Ketol District, Central Aceh Regency.

2. LITERATURE

2.1 Waste

Hieronymus, B. S. (2009). Waste is waste material from the results of human activities or natural processes that have no economic value. Susilowarno (2007) waste is the result of human programs in meeting their needs and waste disposal will be dangerous if without prior treatment. Another definition of waste was also conveyed by Karmana (2007). That waste is the rest of human activities that can become pollution or pollution for the surrounding environment. Waste is all parts produced by human and animal activities in the form of solid, liquid sludge or gas that is disposed of because it is no longer needed or unwanted. Even though they are considered useless and unwanted, sometimes these materials can still be reused and used as raw materials (Damanhuri, 2010). Based on the above opinion, waste is a waste product that cannot be used anymore, but according to its type, not all waste cannot be used, there are some wastes that can still be handled and utilized.

Sugarcane Cultivation

According to Chandra Indrawati 2010. There is also a classification of sugarcane plants as follows:

Scientific classification

- Kingdom: Plantae (plants)
- Super division: Spermatophyta (plants that produce seeds)
- Division: Magnoliophyta (plants that have flowers)
- Class: Liliopsida (plants with single cotyledons or monocot seeds)
- Order: Poales
- Family : Graminae or Poaceae
- Genus: Saccharum
- Species : Saccharum Afficinarum Linn

According to S. Sudiarso, 2016. The technique of sugarcane cultivation must be considered in order to produce maximum sugar. The activities carried out in sugarcane cultivation are as follows:

1. Provision of seeds
2. Land preparation
3. Land preparation
4. Setting the drainage pattern
5. Planting
6. Plant maintenance

Economic Value of Sugarcane Waste Production

Sugarcane waste or often called bagasse is waste produced by sugar factories. Usually bagasse is used as boiler fuel, fertilizer, animal feed, and a mixture of paper materials. In this study, bagasse is used as the main fuel for cooking brown sugar cane because it is highly flammable due to the substances contained in it. The fact of this study states that sugarcane waste is still in the low category

Actually, if viewed from the bagasse ash which comes from the burning of bagasse, the bagasse has the opportunity to be a raw material for the manufacture of silica gel, (Yusuf et al., 2004) bagasse ash contains a lot of SI elements. If the bagasse ash is extracted, approximately 50% silica will be obtained (Affandi, 2009). Thus, the use value and economic value of bagasse into silica products will definitely increase.

Bagasse is very economical if it is used properly and produced in various forms. In this study at the Sulaiman Ali sugarcane refinery, waste or bagasse was only used as the main fuel for cooking brown sugar cane, the Sualiman Ali refinery produced its own waste or dregs because it was very profitable to replace firewood. If the Sualiman Ali refinery produces waste as a material that is sold, it is likely that profits will definitely increase because of the economic value of sugarcane waste as the main fuel or a substitute for firewood. We only calculate from the purchase of firewood if it is not replaced by sugarcane waste, the price of one truck of firewood is Rp. 450,000 .

Revenue Revenue (R)

Business revenue is the amount of money (rupiah) which is calculated from all products sold. In other words, revenue is the result of multiplying the number of products (Q) sold with the price (P). It can be understood that not all of the products produced by a business can be sold or sold, which for example due to damage or defects, are consumed by themselves.

$$R = Q \times P$$

Description :

R = acceptance

Q = product

P = price

R/C Ratio

According to Darsono (2008) in Sari (2011) the R/C Ratio is the number of ratios used to see the relative benefits that will later be obtained in a project or a business. Actually a business will be said to be feasible if the R/C value obtained is said to be greater than 1. This can happen because, if the R/C value is higher, then the level of profits obtained in a business can be higher.

The use of the R/C ratio is known to aim to determine the extent of the results obtained from profitable businesses in a certain period.

R = revenue = revenue, C = cost = cost and Ratio = comparison.

Sari (2011) explained that according to Rahmanto (1998) in Elisabeth (2006), a simple formula for R/C ratio can be written:

R/C Ratio = revenue : total cost

criteria:

If, $R / C > 1$ then a business will be said to be feasible or profitable,

If, $R/C < 1$ then the business is said to be unfeasible or a loss.

If, $R/C = 1$ then the business is worth it or break even..

3. Research Methodology

Usually the workers who pull the dry dregs to get closer to the cooking furnace have already collected the bagasse for one single cooking of sugar cane juice or brown sugar.

The method used in this research is to calculate:

Cost (TC)

$$TC = FC + VC$$

Description :

TC = total cost (total cost)

FC = fixed cost (fixed cost)

VC = variable cost (variable cost)

Admission (TR)

$$R = Q \times P$$

Description :

R = acceptance

Q = product

P = price

Income (π)

$$= TR - TC$$

Description :

= operating income

TR = acceptance

TC = total cost

R/C Ratio (Comparison)

R/C Ratio = TR : TC

TR = receipt

TC = total cost

Operational Definitions and Limitations

1. Utilization is an activity, process, method or act of making something that exists to be useful and useful.
2. Waste is waste generated from a production process, both industrial and domestic (grey water).
3. Sugarcane (*saccharum officinarum* linn) is a plant as a raw material for sugar.
4. Economic analysis is an action / behavior in which we can obtain inputs of goods or services.
5. Cost is all the sacrifices that need to be made for a production process.
6. Revenue is the amount of money received by the company for the sale of products.
7. Revenue is the result obtained from the activities of a company.
8. R/C ratio is the amount used to see the relative profit that will later be obtained in a company.

4. Result and Discussions

The Sulaiman Ali Sugarcane Refinery is a home industry that runs its business in the field of making brown sugar, the Sulaiman Ali Refinery which is located at Jln. Takengon-Angkup, Blang Mancung Barat, Ketol District, Central Aceh Regency. The boundaries of the West Blang Mancung Village area.

- In the east it is bordered by Bukit Hayatun Village
- In the west it is bordered by Kampung Paya Banning
- In the north it borders with Kampung Jaluk
- To the south, it is bordered by Kampung Nangka

Sulaiman Ali's sugar cane refinery was established in 2006 with a factory area of 45 x 25 meters and a building area of 20 x meters. This refinery had stopped operating due to the earthquake on 07-02-2013. Causing the building and cooking kitchen to collapse. So that the sugar cane was diverted to his brother's Blang Nail refinery, because almost 90% of Mr. Sulaiman Ali bought sugar cane from Blang Paku village.

The refinery can operate again 6 months after the earthquake, the repair cost to rebuild the Sulaiman Ali refinery is Rp. 30 million. After the building has been repaired the Sulaiman Ali refinery is back in operation until now.

4.1. Dregs/Wet Waste Transportation

Wet waste transportation is the initial process of sugarcane waste carried out after grinding sugar cane from a holler machine, waste that is still wet and heavy is stacked in one section for the initial process of processing sugarcane waste utilization, usually wet waste is put together in a place adjacent to the machine. This is done to make it easier for milling and initial stacking of sugarcane waste, the wet pulp usually has a pleasant aroma and no smell, so it has no problems for employees who work as grinders to the initial buildup of sugarcane waste. Initial fertilization is done by 2 people with 7 hours of work and the same person milling sugarcane waste.

4.2. Drying Waste/Sugarcane Bagasse

After the sugarcane waste is stacked into one part, then the waste or dregs are lifted using a wheelbarrow to dry. The place for drying is the factory terrace or factory yard. The drying process is usually done when the weather is good or hot. Usually, drying is done up to 3 or 4 days if the weather is not too hot, maybe 1 dry day if the weather is really hot. The dregs or waste is dried under the sun until it is completely dry and can be used as fuel or a substitute for firewood. This is done every day when the refinery is operating or milling. Usually the drying of sugarcane waste is carried out by 1 worker with a total of 7 working hours.

4.3. Dregs/Dry Waste Transport

The process of transporting the dried bagasse is the final process carried out after the waste or bagasse is completely dry. The dregs that are dried on the terrace or factory yard are completely dry and then transported. This is done by 2 workers using a lifting device, namely a stretcher. The dried dregs are placed in a warehouse or room that is far from the reach of water or rain and adjacent to the sugarcane juice cooking furnace. This is almost done by all sugarcane refineries. After the bagasse is dry and piled together, the bagasse is directly used as the main fuel or a substitute for firewood. Sugarcane waste processing is carried out every time the brown sugar cane is cooked. When used or used, sugarcane waste is pushed closer to the cooking furnace by one worker, or a person who works as a cook fire guard, while the tool used to put the waste into the cooking furnace is a not too long iron measuring 1 M. The ends are wrapped with cloth or rubber so as not to overheat when entering the dregs into the cooking furnace.

4.4. Economic Value of Sugarcane Waste Production

Sugarcane waste or often called bagasse is waste produced by Sulaiman Ali's sugarcane factory or refinery. Usually bagasse is used as boiler fuel, fertilizer, animal feed, and a mixture of paper materials. In this study, bagasse is used as the main fuel for cooking brown sugar cane because it is highly flammable and also because of the substances contained in it. The fact of this research states that sugarcane waste is still in the low category or not developed.

Bagasse is very economical if it is used properly and produced in various forms. In this study, at the Sulaiman Ali sugarcane refinery, waste or bagasse was only used as the main fuel for cooking brown sugar cane, the Sulaiman Ali refinery produced its own waste or dregs because it was very profitable as a substitute for firewood. If the Sualiman Ali refinery produces waste as a material that is sold, it is likely that profits will definitely increase because the economic value of sugarcane waste as the main fuel or substitute for firewood is very good. The calculation is adjusted based on the purchase of firewood. if it is not replaced by sugarcane waste, the price of one truck of firewood is Rp. 450,000. even though one truck of firewood does not run out in one cooking of sugarcane juice, it still costs a lot to buy the firewood, therefore bagasse or sugarcane waste is very profitable and has economic value when used by sugarcane refineries as a substitute for firewood or the main material for fuel.

Utilization of Sugarcane Waste in Sulaiman Ali's Sugarcane Factory, Blang Mancung Village, Ketol District, Central Aceh Regency

4.1.1. Cost

Costs are objects that are recorded, classified, summarized and cost accounting. The cost accounting process can be shown to meet the needs of the factory or refinery. The cost classifications contained in the refinery are divided into:

4.1.2. Fixed costs (FC)

Fixed costs are production costs incurred in the production process that are issued in a certain period with a fixed amount but do not depend on the amount of production in the business.

From the data, it can be seen that the use of the total fixed costs for the production process of brown sugar cane and waste/bagasse is Rp. 8,891,000, namely in the form of depreciation of brown sugar cane of Rp. 8,321,000 and the depreciation of waste/bagasse of Rp. 570,000.

4.1.3. Variable cost (VC)

Variable costs are costs that are used up in the production process. Included in this cost are the cost of raw materials and auxiliary costs. Based on the results of research and discussion of variable costs in business, it can be seen in the table below. the production of brown sugar cane and waste/bagasse is Rp. 16,490,000, which is in the form of the cost of brown sugar cane of Rp. 16,090,000, and the cost of waste/bagasse is Rp. 400,000. More details can be seen in the attachment.

4.1.4. Total cost (TC)

Production costs are the costs incurred, production costs that are taken into account in this study are all costs incurred by starting from investment, depreciation, raw materials, auxiliary materials and labor. These costs are fixed costs and variable costs, which can be seen in the table below.

Judging from the data, it shows that the total cost for the production process of brown sugar cane and the production process of waste/bagasse is Rp. 25,381,000 which consists of fixed costs of Rp. 8,891,000 and variable costs of Rp. 16,490,000.

Revenue Revenue (R)

Based on the data obtained Rp.81,272,488 receipts show that the receipt of waste/bagasse is Rp. 1,474,000 or 2% of sugar cane farming revenues.

acceptance formula:

$$R = Q \times P$$

Description :

R = acceptance

Q = product

P = price

$$R = \text{cane sugar} \times \text{Rp.9500/kg}$$

$$1 \text{ month} \times \text{Rp.9500} = \text{Rp.79.798.000}$$

$$= \text{waste/bagasse} \times \text{Rp. 190/kg}$$

$$1 \text{ month} \times \text{Rp.190} = \text{Rp.1.474.000}$$

$$= \text{Rp.79.798.000}$$

4.2.1. Income ()

Revenues that arise at Sulaiman Ali's sugarcane refinery are from economic events, including sales of goods, sales of services, cooperation between factories or other sugarcane refineries. Revenue is the amount charged to customers for goods and services sold, and is the most important element in a sugarcane refinery, because income will determine the success of the refinery. Therefore the refinery must try as much as possible to obtain the expected revenue. Revenue is basically derived from the sale of the resulting sugar.

Based on the table above, the income is Rp. 54,417,000, it can be seen that the income is 98% and 2% becomes 100% profit In general, income can be formulated:

$$= TR - TC$$

Description :

= operating income

TR = acceptance

TC = total cost

Where :

$$=Rp. 79,798,000 - IDR 25,381,000 = IDR 25,381,000$$

4.2.2. R/C ratio

The R/C Ratio is the ratio used to see the relative profit that will be obtained at the refinery in sales. Actually, the refinery business will be said to be feasible if the R/C value obtained is said to be greater than 1. This can happen because, if the R/C value is higher, then the level of profit obtained by the refinery can be higher.

The use of the R/C ratio is known to aim to determine the extent to which the results obtained from the refinery business are profitable in a certain period.

R = revenue = revenue, C = cost = cost and Ratio = comparison.

can simply be written the formula R / C ratio:

R/C Ratio = revenue : total cost

Where :

$$=Rp.79.798.000 : 25.381.000 = 3.14400538$$

criteria:

If, $R / C > 1$ then a business will be said to be feasible or profitable,

If, $R/C < 1$ then the business is said to be unfeasible or a loss.

If, $R/C = 1$ then the business is worth it or break even. Based on the calculation of R/C above, then this business is feasible, because the value of $R/C = 3.14400538$ or $R/C > 1$.

5. Conclusions and Recommendations

Based on the results of the study, the income ($\pi=TR-TC$) was Rp. 54,417,000. where revenue or TR = Rp.81,272,488 and production costs Rp. 25,381,000 . Based on the results of the study, the feasibility of Sulaiman Ali's sugar cane refinery (R/C Ratio) is = 4.66235, where $R/C > 1$ then a business is said to be feasible or profitable. Based on the research results obtained a healthy environment that is protected from various things that can cause disturbances to public health or all the biological components contained in the bagasse under study. It is suggested to the owner of the Sulaiman Ali refinery, Kampung Blang Mancung, Ketol District, Central Aceh Regency, to optimize sugar cane milling so as to produce more waste and increase drying time in order to increase the cooking of sugar cane juice and also the amount of brown sugar cane produced can be maximized.

6. References

- i. S. Z. Harahap and M. H. Dar, "APLIKASI DAN PERANCANGAN SISTEM INFORMASI PEMESANAN PADA UPI CONVENTION CENTER DENGAN MENGGUNAKAN BAHASA PEMROGRAMAN PHP DAN MYSQL," *INFORMATIKA*, vol. 6, no. 3, pp. 24–27, 2018.
- ii. A.Fiar Malayadi, 2017. Karakteristik Dan Sistem Pengolaha Limbah Bahan Berbahaya Dan Beracun , Laboraturium Universitas Hasanuddin.Dalam Skripsi Bagian Kesehatan Lingkungan Fakultas Kesehatan Masyarakat Universitas Hsanuddin Makasar.Makasar
- iii. Cahyonugroho.2002. Karakteristik Limbah Yang Berfisol Cair ,Kimia, Dan Biologis .dikutip oleh artikel F Syafitri.2000.
- iv. Chandra indrawanto, 2010 . Budidaya Tebu, Varietas ,Perbanyakan ,Laha Kering. Di Ambil Dari Abstract Bududaya Tebu Oleh S Sudiarso . 2009.
- v. Damanhuri, 2010. Limbah Yang Dihasilkan Oleh Aktivitas Manusia.Https://Brainly.Co.Id Tugas Pada 28 September 2014 Tentang Pengertian Limbah.Di Akses Tahun 2020.
- vi. Darsono, 2008, Analisis Ratio Keuangan Dan Ratio Keuangan Yang Mempengaruhi Auditor Dalam Memberikan Opini Going Concern Pada Auditee, Oleh R Dinawati , Artikel.
- vii. E.Ernasari,2018, Pemanfaatan Tanaman Dan Sari Tebu.Jurnal Pendidikan Teknologi Pertanian, Vol 4 (2018)
- viii. Hieronymus,B.S,2009.Limbah Adalah Proses Alam Dari Manusia Http://Www.Maxmanvuce.Com.Umum.DiaksesFebruari 2020.
- ix. Karmana,2007.Penjelasan Tentang Limbah.Mengikuti Isi Keputusan Menperindang RI.No..231/Mpp/Kep/7/1997.Tentang Limbah, Https://Forestreract.Co.
- x. Karter Dan Usry. 2006, Biaya Sebagai Nilai Tukar,Pengeluaran,Pengorbanan, Untuk Memperoleh Manfaat. Diambil Oleh Krista 2006
- xi. Kusnadi. 2000, Akuntansi Keuangan Menengah.Edisi Keduapuluhsatu.Di Ambil Oleh NR Chairuni, jakarta. 2000 .https://repository.widyatama.ac.id

- xii. Lutony,1993.Budidaya Tanaman Tebu.Journal.Ipb.Ac.Id. Oleh Bardansyah 2015.Pdf2008.
- xiii. M.Rusmono,2008.Klasifikasi Limbah Padat dan Tekisnya .Modul 1-Sy.As.56.Universitas Terbuka 2008.
- xiv. Mubyarto,A1986.Https://Doseneekonomi.Com.Sda. Jenis-Jenis Produksi Didalam Dunia.1986 Diakses Kembali Pada Tahun 2020.
- xv. Mulyadi.2012, biaya adalah sumber ekonomi .Perekonomian Pusat Negara . Jawa Barat 2012
- xvi. Poerwadarminto, 2002 Kata Dasar Dengan Imbuhan Men-An Buku Besar Bahasa Indonesia, Jakarta.
- xvii. Pramithasari, Citra Anggun, 2011, Analisis Manfaat Ekonomi Pengolahan Limbah Pohon Jati, Institut Pertanian Bogor, Bogor
- xviii. Pusat Bahasa, 2002.Kamus Besar Bahasa Indonesia Kontemporer,Balai Pustaka,Jakarta
- xix. Ruchmana Rahmat, 2004. Dalam jurnal Sikvia Fitri Mei Arini 2015, Kabupaten Jember 2015.
- xx. Pramithasari, Citra Anggun, 2011, Analisis Manfaat Ekonomi Pengolahan Limbah Pohon Jati, Institut Pertanian Bogor, Bogor
- xxi. Render Dan Heizer. 2001, Penyebab Faktor Produksi Yang Kurang Optimal. jrmsi.studentjournal.ub.ac.id
- xxii. Silvia Fitri Mei Arini, 2015, Karakter Morfologi Varietas Tebu Pada Beberapa Kondisi Cungkaman, Penelitian Mai 2015-Desember 2015
- xxiii. Silva, Anggun Larasati, 2018, Analisis Finansial Pemanfaatan Ampas Tebu (Bagasse) Sebagai Bahan Bakar Pembangkit Listrik Di PT Gunung Madu Plantations, Universitas Lampung, Bandar Lampung
- xxiv. Susilowarno,Warno, 2007 Bahayanya Limbah Jika Tidak Adanya Penanganan Dan Pembuangan 2007
- xxv. Subagyo , 2000 Layout Fasilitas Diatur Sedemikian Rupa Sehingga Proses Produksi Dapat Berjalan Lancar Dan Efisien. Oleh MK UTOMO Https://Eprints.Uns.Ac.Id
- xxvi. Suroto, 2000. Faktor-Faktor Yang Mempengaruhi Pendapatan Pekerja. Penelitian 2000 : 26. Https://Media.Neliti.Com
- xxvii. Wijayanti, 2008. Pengolahan Tanaman Tebu . Pabrik Gula Tjoekir PTPN X, Jombang Jawa Timur 2008.