

## **ANALYSIS OF CIRCULAR ECONOMY APPROACH OF SOLID WASTE MANAGEMENT IN ACEH TENGAH**

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### **Abstract**

*Aceh Tengah district, known as the Leuser region, plays an important role in preserving the environment and improving the economic welfare of the community. To address waste management issues, the researchers aimed to apply the concept of circular economy. By using a qualitative method with a scientific approach to analyse various events, obtaining indirect observation data and indirect interviews and research using triangulation techniques. This concept can be useful to encourage communities to minimise by creating products that can be repaired and have high value, thus having a positive impact on the environment and local economy. It is crucial for the private sector to play an active role in addressing the waste problem in Indonesia. The global business sector has started to utilise the circular economy approach to combat the waste problem. The circular economy focuses on the reduction, reuse, recycling and refurbishment of materials, thereby maximising the use of raw materials and improving economic well-being. Furthermore, by implementing innovative waste management practices, Aceh Tengah can generate valuable and sustainable solutions for the region, the community, and the private sector in line with the changing times..*

**Keywords:** *Circular Economy, Solid Waste, Aceh Tengah*

### **A. Introduction**

According to reported information, there are two main factors that cause Indonesia to be one of the largest waste producing countries in the world, namely human behaviour and government policies. Littering behaviour, such as burning, burying or throwing waste into rivers is one of the main causes of Indonesia's waste problem. This is due to people's habit of not disposing of waste in its proper place. Therefore, to help maximise waste management, the private sector plays an important role in addressing Indonesia's waste

problem (Rahmat Syarif, Anhar Januar Malik, Khaerunnisa Nur Fatimah Syahnur, Fitriyani, Mirandha Ariesca Riana, 2022).

Aceh Tengah district is located in the leuser ecosystem, which is the lungs of the world (RPJM Aceh Tengah, 2017). The elevation is between 200 to 2,600 M, located in an area above sea level covering 4,454.50 km<sup>2</sup> and has a diversity of natural resources that provide positive benefits and welfare for the local community. However, the volume of waste in the Aceh Tengah region is also increasing.

This problem can also occur for the following reasons: As a result of the progress and development of technology that is not environmentally friendly, it has an impact on health, economic losses, and damage to the natural environment (Ukas, 2020). Then, the government has the authority to formulate waste management policy strategies in accordance with government policies, as well as encourage partnerships and networks in management, organisation, coordination, guidance and performance monitoring in waste management (Prayuda, 2018).

According to Law No. 32/2009, article (1) Waste is the residue of activities or results that are no longer used. Expressed in Law No. 18/2008 on waste management (Anggreni, 2012). All municipalities should pay more attention to the waste disposal system into a waste management system. Management is an activity carried out to optimise the use of resources and manpower in an organisation in order to achieve the desired goals (Dr. Hj. Fory A. Naway, 2016). By ensuring that in everything related to the implementation of this policy, it is necessary to supervise all activities involved in the implementation process (Muntholib, 2020).

In addition, if the government pays attention by monitoring the conditions of the people and the environment in the area, it will be possible to minimise the waste generation that is happening, in the current government there are also constraints related to the funds spent by the Aceh Tengah Regional Government regarding the expansion of landfill land. However, efforts can be made on this issue by implementing transformation by applying the concept of circular economy that can provide significant benefits that positively impact the environment, development sectors and Indonesia's future economic growth. In addition, this principle can also be an important part of sustainable waste management (Isnaeni & Arista, 2022).

This concept will be a solution to the solid waste problem by utilising and maximising waste to be converted and reused which has economic value. Thus, to implement such changes, support from the government and awareness and responsibility from the

community are required. The aim is to reduce the negative impact of increasing waste volume on the environment, thus creating a clean, healthy and sustainable environment through the implementation of the circular economy concept.

## **B. Research Methods**

This research will be described using a qualitative method with a scientific approach to analyse various events that occur in waste management and this approach can support the concept of circular economy, as an implementation and provide recommendations to overcome the obstacles that occur. Data is obtained through two sources, namely indirect observation by utilising digital platforms such as YouTube, Instagram, and other social media and indirect interviews by using a person's statement on social media as primary data, then data sourced from previous research, books, websites, regulations and other supporting documents.

To confirm the validation of the data obtained during the research process, the researcher used triangulation techniques. Based on (Patton & Cochran, *A Guide to Using Qualitative Research Methodology*, 2002, pp. 27) triangulation is a method to increase the accuracy of the data obtained, looking for evidence from various sources and then comparing it with field findings and also the results of various sources obtained. This is useful for gaining a deeper understanding of the problem being researched.

In this study, the researcher compares the theoretical review in the form of the circular economy concept and then correlates it with the field findings. The results of related parties' statements on various social media will be used as evidence of interviews, indirect observations, and documents obtained will be compared together to gain objectivity in data interpretation and produce in-depth analyses of solid waste management to the fullest.

The novelty of this research offers an in-depth analysis of the application of the circular economy approach specifically in Aceh Tengah, an area that may not have been studied much in this context. The novelty lies in the specific geographical focus and how the circular economy approach can be adapted to meet local needs and challenges. Whereas previous studies have not explored the latest technology in the context of waste management in the same area but only how policies can be done to address waste management.

## **C. Results and Discussion**

Based on the results of observations that occur and from the literature review that the cause is due to limited transportation, limited facilities and infrastructure as well as limited TPA (Final Disposal Site) and based on Law No. 32/2009 concerning Environmental Protection and Management, every business actor can benefit if they continue to preserve

the environment while minimising waste production into valuable products (Muharsono, 2021).

However, with the increasing volume of population and consumption and the desire to improve human living standards, there is an increase in waste generated. However, it can be seen from the percentage of waste generation that occurs in the Aceh Tengah Regency area with data, namely:

Based on information obtained from SIPSN (National Waste Management Information System), there are several data on waste accumulation in the city/district of Aceh Tengah.

**Table 1 Waste Accumulation in Aceh Tengah District**

<b>Years</b>	<b>Daily Waste Generation (Tonnes)</b>	<b>Annual Waste Generation (Tonnes)</b>
2019	100.97 Tonnes	36,853.74 Tonnes
2020	101.55 Tonnes	37,067.15 Tonnes
2023	109.73 tTonnes	40,050.24 Tonnes
<b>Total</b>	<b>312.25 Tonnes</b>	<b>113,971.13 Tonnes</b>

Resource: National Waste Management Information System

In the data obtained from Serambi Aceh news, the percentage of waste accumulation in Aceh Tengah district in 2020 reached 101.55 tonnes per day, then 38,716.64 tonnes per year. Daily transportation is estimated to be around 8,889.34 tonnes and more than 22.96% of waste production, due to the limited transportation system and accumulation in each region (Mahyadi, n.d.).

The application of the circular economy enables solutions to desired problems by creating products that can be repaired, as well as having a high appreciation value. This approach is also established as reducing environmental impact and increasing efficiency through the use of fewer materials, easy-to-disassemble product designs, easy-to-close material cycles and the development of innovative services (Manik, 2022). In addition, in this concept, goods that have been used can be reprocessed through the 5Rs, namely (Reduce, Reuse, Recycle, Replace, Repair), as waste that will be reproduced so as to minimise the impact of waste that will impact the environment and can also be reused as raw materials or other products. There are examples of circular economy, such as food waste, wood products, leaves or biopolymeric materials that produce (compost) while non-organic including polymers (plastics) and even electronic materials as next generation products (Edwin et al., 2019).

The waste collection process in Aceh Tengah is carried out by DLHKP officers by cleaning and sorting waste at Temporary Disposal Sites (TPS) by collecting in one location with waste from various areas around the city only and located in Takengon city precisely in the Paya Ilang area. Then the waste will be transported using several trucks as transporters and taken to the Final Disposal Site (TPA) located in Uwer Tami, Kampung Muli Jadi, Silih Nara District. Initially, the community living in Uwer Tami Village objected and did not allow waste to be dumped in the area and even blocked the landfill which was used as a final disposal site, but the blocking was finally reopened by the local community due to an approach by persuading and convincing the community together with a number of authorities including the Central Aceh Police.

Then at this time waste management is still minimal and needs to be added because it only has one unit as a production tool to recycle this management in Kampung Paya Tumpi Baru, which focuses on (TPS3R), namely Waste Management Sites reduce, reuse, recycle, and repair (Agus, n.d.).

Where reducing functions as reducing waste which can be done by buying packaged goods in bulk, using refillable products or being able to bring your own containers when buying food or drinks by avoiding disposable items such as bags and tumblers that can be reused as drinking water containers. Then reusing reusable items to create a cleaner and more sustainable environment, such as utilising organic waste that can be used as compost to fertilise plants thus minimising waste sent to landfills. The utilisation of recycled waste for recycling can be applied where this has also been widely done and utilised by the community by transforming used goods with creations that are more useful and can be utilised by turning them into other objects such as plastic bottles that can be turned into flower vases or plant pots that can be done by the community itself or other production from the private sector and repair management by repairing damaged goods so that they can be repaired and reused according to the feasibility of use so that they no longer buy new goods if they can still be reused (Junaidi, 2023).

It can be seen around our environment that waste is still considered an important problem for the region and also damages the beauty of the environment, but there is one area that uses waste as an economic value on the shores of Lake Lut Tawar which is also a comparative study area in household waste management that has shown the success of the program, namely in Lot Kala Village, Kebayakan, Central Aceh. Where the utilisation is by cutting plastic waste to be sold and sent to Medan. This is able to reap the benefits that can be utilised as business value at a selling price, this management is only able to manage 80

tonnes of waste per day and for compost management can also be used by the community as plant production (Array, 2021).

Handicrafts can also improve the welfare of the community carried out by PKK mothers in Kebayakan District, Central Aceh, which previously this craft was only occupied by a mother named Ibu Neni to recycle plastic waste as a hobby that became a positive activity. But this is very useful for them so that it can be a new product such as making bags, baskets, wallets, accessories and even clothes as creations produced from recycling used plastic waste. This craft will be exhibited for Mother's Day commemorations and other events and can even be sold even to Banda Aceh with prices that vary by looking at the size of small and large products with selling prices ranging from 50-100 thousand rupiah (Takengon Lintas Gyo, 2014).

Not only that, changes that can be made in addition to handicrafts are changes that come from plastic waste that is often done in Kuyun Village, Celala District, Aceh Tengah is managing plastic waste used as fuel oil or BBM. This is also a concern for the handling of discarded waste, with technology as a useful support after testing the functions that have been completed so that it can operate properly and optimally in the form of saving plastic waste. The amount of waste that can be processed is 100 kg of used plastic which is equivalent to 100 litres of fuel be it premium, kerosene or diesel. and developed by (BUMK) Badan Usaha Milik Kampung Burnuyem Center (Eda, 2022).

Previously, waste was left unattended, but now waste management that can become a selling value continues to be carried out as long as the management does not stop, it can produce products that can be sold so that it can provide benefits and income opportunities for the village community financially. It is hoped that it can become a role model of productive waste management for surrounding villages in Central Aceh, especially Paya Ilang village which is the location of the most waste production and is on the road to the campus of Gajah Putih University located in kung village, Pegasing sub-district where there are piles of garbage that are very worrying and disturb the beauty of the area leading to the campus (Romadani, n.d.).

Then according to the report of the Ministry of National Development Planning/Bappenas, several industrial fields in Indonesia will be prioritised in the implementation of the circular economy, namely industry, food and beverages, packaging, clothing and textiles, construction services, plastics and electronics. The circular economy will open up job opportunities in various industrial fields, where experts in related skills and professionals will find opportunities to create and deliver benefits (Wijaya & Fasa, 2021).

However, there are some limitations in this study related to improving waste management, especially related to the limited provision of technology for recycling processes. If government policies do not actively support the implementation of circular economy, then the implementation of this approach will face difficulties. To address this issue, possible mitigations include the adoption of the latest technologies and collaboration with policymakers in designing effective policies. This includes the development of better infrastructure for landfills, recycling facilities, as well as waste management technologies. Therefore, by identifying limitations and applying appropriate tactical mitigations, waste management in Aceh Tengah can be significantly improved through a circular economy approach.

The researchers also suggested that in order to produce a good circular economy, it is necessary to ensure that the process of formulating waste management policies in each region must be more participatory, so that the policies issued have a wider impact on society and technology can also play a role in creating added value, creating solid waste into something valuable (Sufianti, 2011). The researcher recommends suggestions based on the results of previous research to be implemented by the government and non-government sectors in forming solid and measurable cooperation, so as to produce novelty and value in waste management and encourage the successful implementation of the circular economy concept (Sufianti, 2011).

#### **D. Conclusion**

Based on the problems that can be seen, solving these problems requires the effectiveness of statutory provisions and also the application of circular economy concepts that can work together with various government and non-government sectors to involve stakeholders in collaborative planning by involving other stakeholders. The provision of infrastructure is also important to support an activity in the management of solid waste problems that need to be addressed by implementing policies, reducing and managing waste effectively so as to minimise waste generation in each region. For the process of implementing certain activity programs also requires movement from others, as a process of implementing policy formulation and organisational goals. By implementing regulations to provide rules for the community to apply the circular economy concept as a change that will be implemented by the government and must be able to enable referring to public awareness to utilise and minimise waste generated so that waste management can run in a balanced, effective and efficient manner.

## REFERENCE

Anggreni, Maria Winda. 2012. "PENGELOLAAN SAMPAH UNIVERSITAS INDONESIA PENERAPAN KONSEP BANGUNAN HIJAU ( Studi Kasus : Kantor Pusat PT . Pertamina, Jakarta )." *Tesis*.

Dr. Hj. Fory A. Naway, M.Pd. 2016. *Strategi Manajemen Pembelajaran*.

Edwin, Abang, Syarif Agustin, Cama Juli Rianingrum, Abang Edwin, Syarif Agustin, and Cama Juli Rianingrum. 2019. "FOR SUSTAINABLE DEVELOPMENT" 2 (1): 93–106.

Isnaeni, Nor, dan Dwi Arista. 2022. "Konsep Ekonomi Sirkular dalam Industri Tekstil Alami: Di Pertanian – Budidaya Talum Di Luar Pertanian sebagai Pewarna Alami," 524–32.

Mahyadi. "Hanya 22 persen sampah di Aceh Tengah yang bisa diangkat setiap hari." *Serambinews*. Diakses 12 September 2023. <https://aceh.tribunnews.com/2020/06/24/hanya-22-persen-sampah-di-aceh-tengah-yang-bisa-terangkut-setiap-hari>.

Manik, Yuni Mariani. 2022. "EKONOMI SIRKULAR, POLA PIKIR DAN PENDIDIKAN UNTUK KEBERLANJUTAN EKONOMI" 10 (1): 115–28.

Muharsono. 2021. "PETERNAKAN (STUDI DI DESA SENDANG, KECAMATAN SENDANG, KABUPATEN TULUNGAGUNG), XIV (1): 188–212.

Muntholib, Abdul. 2020. "Strategi Pengelolaan Wisata Halal di Pondok Pesantren: Studi Kasus di Annur 2 Pondok Pesantren Pariwisata Bululawang Malang" 4 (1): 1–19.

Prayuda, Rendi. 2018. "TATA KELOLA KOLABORATIF DALAM KEBIJAKAN LINGKUNGAN (STUDI KASUS PEMANFAATAN LIMBAH KELAPA SAWIT DI KABUPATEN ROKAN HULU)" 14 (2): 185–98.

Rahmat Syarif, Anhar Januar Malik, Khaerunnisa Nur Fatimah Syahnur, Fitriyani, Mirandha Ariesca Riana, Iskandar Arifin. 2022. "Pengantar Konsep Ekonomi Sirkular melalui Webinar 'Ekonomi Sirkular: Solusi Masalah Sampah di Indonesia'" 1 (1): 28–35.

Sufianti, Ely. 2011. "PERENCANAAN KOLABORATIF DALAM PENGELOLAAN LIMBAH BERKELANJUTAN" VIII (3): 322–29.

Ukas, Zuhdi Arman. 2020. "ANALISIS PERATURAN PEMERINTAH NOMOR 101 TAHUN 2014 TENTANG BAHAN BERBAHAYA DAN BERACUN DI KOTA BATAM" 8.

Wijaya, Angga, dan Holman Fasa. 2021. "Aspek Hukum dan Kebijakan Pemerintah Indonesia tentang Ekonomi Sirkular dalam Mencapai Tujuan Pembangunan Berkelanjutan" 10: 339–57.

Junaidi, A. A. U. (2023). analisis pengelolaan sampah dengan prinsip 3R. *Volume*, 7, 708.



M, H. setiady agus. (2023). *Waste Production Reaches 207 Tons Per Day, Central Aceh Needs NEW TPST*. ANTARAACEH.<https://aceh.antaranews.com/berita/345006/produksi-sampah-capai-207-ton-per-hari-aceh-tengah-butuh-tpst-baru>

Romadani. (2023). *ketua YARA menyoroti sampah di kota Takengon, ada apa?* Tribungayo.Com. <https://gayo.tribunnews.com/2023/12/08/ketua-yara-sorot-sampah-di-kota-takengon-ada-apa>

Array. (2021). *waste in Gayo should not be a disease, but a business*. Nukilan.Id.<https://nukilan.id/sampah-di-gayo-jangan-jadi-penyakit-namun-bisnis/>

Eda, fikar w. (2022). *yasir arafat sang reje kuyun, processes plastic waste into fuel and tourism villages*-SerambiNews.<https://aceh.tribunnews.com/2022/03/07/yasir-arafat-sang-reje-kuyun-mengolah-sampah-plastik-jadi-bbm-dan-kampung-wisat>

Takengon Cross Gyo. (2014). *PLASTIC WASTE HAS ECONOMIC VALUE IN KEBAYAKAN*. <http://lintasgayo.co/2014/12/19/sampah-plastik-bernilai-ekonomi-di-kebayakan/>