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Article

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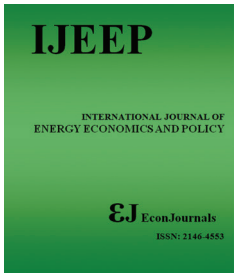

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Implementation of Sustainable Development Goals to Makassar Zero Waste and Energy Source

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ABSTRACT

The purpose of this research is to answer the problem and to apply the concept of waste management in Manggala subdistrict, the concept is the establishment of the waste school, waste bank, and 4R program assistance, to complete the waste Well-managed. The method of research that will be descriptive by describing factual and more accurate in seeing the reality and behavior of the population in the region as an object that becomes the research area so that the data can be explain the real conditions that exist in the field. The implementation of research in the district Manggala gave the idea that waste is very large and becomes a problem, with the implementation of the concept of waste management through the waste school than the public conscious, love the environment together and form Entrepreneurship based waste group so that waste can be reduced every day by 20%, through recycling can improve the community economy, thus the environment is awake and sustainable. Concept applied in Manggala district to become a pilot project so that Makassar city can reach zero waste.

Keywords: Waste School, Waste Bank, Processing, Zero Waste, Energy
JEL Classifications: Q1, Q2, I3

1. INTRODUCTION

The world has been at the forefront of sustainable development until 2030 which has 17 sustainable development goals with a better future goal of the world for the future. The sustainable development goals (SDGs) were established by the Member States of the United Nations in 2015. The establishment of SDGs is a proud thing for the whole world. The world has been giving an overview to the wishes, and indeed it takes the world to this day that is free from poverty and all-around energy, to be fairer, respecting the boundaries of the region, protecting the environment around the world. The global community is thus at a critical point where rethinking how to access to improving sanitation thus better achieving sustainable development for the present and future generation (Orner and Mihelcic, 2018).

Sustainable development in its implementation has a target so that it needs to be realized by the government as a policy determiner either directly or indirectly (Hák et al., 2016). The local government is not only as an implementer development agenda, but also policymakers in the form of rules of how to connect global goals with the local community. The purpose of development in Indonesia mentioned that, in implementing several principles in the SDGs, the United Nations (UN) Member State has agreed on the purpose of implementing sustainable development that is also adopted throughout Indonesia in the form of Implementation of various activities through investment opportunities. Foreign investment can conduct various activities with the transfer of technology and the improvement of labor and environmental management practices will provide assistance for developing countries so as to achieve sustainable development

goals (Sarkodie and Strezov, 2019). There are several principles in the implementation of the development of the first principle is the existence of the universality meaning through the principle can be pushed from the implementation of SDGs in all countries including developed countries let alone developing countries. Nationally implementation of SDGs can be applied throughout the region in Indonesia. For the second principle is this integration means that the implementation of the SDGs should be implemented with high integrity and interrelated to all dimensions socially, economically and also environmental aspects. The third principle is beneficial, it guarantees that the implementation of the SDGs can benefit all communities, especially the range in its implementation by involving all who have an interest like one of the existing cities In Indonesia, the city of Makassar as Metropolitan.

In Indonesia, there are many cities, one of which is the city of Makassar is a city with the category of metropolitan city which is very rapid development with a population of 1.5 million inhabitants. In 2019, the economic growth of Makassar was high enough to reach 8.1% in the year 2019 so it is possible that can be an attraction for residents to migrate to the city or urbanization. Thus the number of population is increasing, and the consumption of people living in urban areas is increasing so that the amount of waste has also increased. Data year 2019 in the city of Makassar amount of waste entered at the final disposal of approximately 900 tons/day. As for the final disposal of the waste, the community is in the district Manggala, this place is a case study of the research.

Manggala is one of the 15 sub-districts in the city of Makassar with a total area of 24.14 square kilometers or about 13.17% of the area of Makassar city which is divided into 8 village areas namely Antang Bangkala, Batua, Biring Romang, Bitowa, Borong, Manggala Tamangapa. The population in the year 2019 is 155,181 people, while the number of people waste can be transported to the end place of disposal of waste in Tamangapa reaches 383 m^3/day, so it can make overload and continue to increase as the population increases. With increasing, waste can cause the land where the final disposal is narrower. The city faced a very severe problem is waste problems, given that it can be caused by very complex waste from the aesthetic aspect, health to economic and environmental losses that lead to natural disasters, (Setyono, 2015).

The waste collection system done by the Community Manggala District is not good. It can be seen from the waste dumped by the people of the region, to dispose of it does not separate between organic and non-organic waste. Increasing accumulation waste without a system in the waste processing can pose a condition of the unsanitary environment, it can be seen with the increasing number of waste dumped at any place, for example to the aqueduct that can be the occurrence of blockages causing flooding when it rains. Strategic handling of waste management is required to mitigate it. According to Minelgaitė and Liobikienė (2019), It is necessary to have efforts to reduce waste or waste that can significantly affect only the behavior of recycling, meaning that waste can be reduced if before to the last place is recycled. The Government of Makassar has already done with various actions on handling and management of waste, but still not touched until the bottom handling level in the group of households.

As SDGs programs in conjunction with waste handling related to third and eighth programs, the third program is to ensure healthy human life and improve welfare for the whole community, associated with process waste Recycling needs through skill and safety training to prevent health and safe working environment, (Schroeder et al., 2019). Thereby ensuring that the handling of waste can improve public health and public concern for healthy living by maintaining environmental hygiene, the eighth program is how to support the economic growth A wider and productive labor absorption, it means that waste management in various ways can create employment opportunities for the community so as to provide economic assurance for the community. In support of the program, SDGs need a strategy so that Makassar can go to zero waste means waste is no longer an issue but it can improve the health and economic Community and as a source of energy, consciously aimed at the efficient use of energy and resources, ideas that are relevant to mitigating, adapting, and building resilience in a changing future (Sullivan, 2017; Dada and Mbohwa, 2018; AlQattan, 2018).

The purpose of this research is how the waste school program, Trash Bank program and 4R implementation assistance that can provide science and understanding to the community about the correct waste processing system that can keep Environment, gaining an economy and creating renewable energy sources. Thus, the problem of waste must be resolved to be settled citizens, if only relying on the final disposal of waste, cannot solve the problem of waste at Makassar City, especially in the Manggala district.

2. LITERATURE REVIEW

Human beings have a lot of needs, in fulfillment of needs such as the need for the bodily and the form of psychic needs to be fulfilled and become human nature in his life, needs can be a good need and can occur Poor needs that can cause ugliness. Malnutrition is common in this regard to poor economic outcomes (Meyer and Mok, 2019). Theoretically, many economic experts give the explanation that human economic needs are not limited, while the fulfillment tool needs very limited, meaning with the limitation of problems faced by the community-sourced from fulfillment Needs in terms of its fulfillment. Inspired by Max-Neef's human needs model, the proposed model supports attractive requests by defining just what the system does, how well, where, and what it is used to achieve it needs (Salado and Nilchiani, 2014). Objects acquired and achievements of humans have never been satisfied and tried to fulfill them. The low consumption of this is what encourages people to always strive to a higher level. Advanced economies are also advancing in terms of fulfilling their needs by generating a wide range of products and also striving to meet the welfare level. Human action regarding the fulfillment of needs both individually and in groups is to use, the consumption of goods that are widely influenced by the magnitude of one's income, customs, and culture that Owned. According to Kahsai et al. (2012); Auffhammer and Wolfram (2014), Low-and medium-sized countries provide evidence of the importance of income levels in causal relationships, this study explains interdependence between the magnitude of consumption and economic growth. So it is necessary to be more wise calculation, this can cause the rest of

the consumption of human use in fulfilling its needs in the form of waste.

Waste results can also be obtained from the development of technology in producing goods and services, the result of the use of various plastics as a wrapper, leaves produced crops, various developments of food packaging, the use of Packaging for medicines, and this can affect the magnitude of the amount of waste. According to Yi et al. (2019), Absorption of technology has a greater effect on economic growth and in general, all kinds of technology are blazing in increasing the regional economy, thereby developing technology and use in various production processes can improve consumer goods products for the community. Other results also show that urbanization encourages economic growth through accumulated physical capital, knowledge capital, and human capital; that the relationship between economic growth and urbanization is one form of interaction; That environmental pollution has a significant effect on urbanization activities, (Liang and Yang, 2019). Environmental pollution can occur as a result of the increasing number of waste, this also happens because the existing industry that uses the technology of the waste is thrown into the river or to the ground so as to cause aggression. According to Jaffe et al. (2002), Pollution due to environmental impacts of social activity are significantly influenced by technological changes, and partly because environmental policy interventions themselves create new constraints and incentives affecting the development process Technology. The development of technology in its use can give rise to an indirect influence that is global warming. Technological influences can cause pollution such as air, water, and soil and can produce waste. Thereby, waste and waste can pollute the environment, such as Indonesia has not handled much of the trash problem and the community has not had awareness, all places considered waste and throw waste in any place so that waste becomes the most polluted environment because everywhere waste is found both on land and at sea.

Handling waste in the Manggala subdistrict needs to have a systematic implementation, thoroughly and sustainably, as for activities in the form of reducing the amount of waste through recycling and processing part of waste into fertilizer or energy source Renewable. The waste problem is the concern of many Parties, because it is very directly related to hygiene, environmental beauty, and public health, especially in the area of Manggala. The increasing level of activity causes more and more activities in various aspects, so it will affect the amount of waste generated from various activities. The pattern of life or social-economic level of consumption is very influential in the amount of waste produced. According to Prasetya et al. (2019), the waste problem is a common problem due to the increasing population as a result of the urbanization process and the pattern of consumption change from consuming natural materials to humans product materials and technological outcomes. This indicates that the population and also the density of each population can be followed by the increase in the amount of waste produced, as well as the urban areas in Makassar that the population is dense so that the Need a good waste processing system.

Waste management needs a strategy so that waste can be managed to the least extent possible so that it cannot disturb and threaten public health. Because good waste management can benefit and maintain public health, and create the beauty of the environment and can create economic opportunities for the community and can also be processed into renewable energy. Waste management includes collecting, transporting up to the end place and destruction of waste so no longer interfere with the health of society and the environment, because the environment of the city and many waste can cause flood and Diseases everywhere and this happens can be the fault of an individual as well as the stakeholders as a decision-maker. The cleanliness of the environment and the clean place can begin with a clean personal self-first, by learning how to love the environment and avoid activities that can damage the environment, such as doing disposal Waste, not in place and reduce the use of products using plastic packaging.

3. METHODOLOGY

Research Model in the form of descriptive research, which is a condition or phenomenon as it is, this research to know the problem by looking at the facts that exist in the field of an object, as well as conducting an assessment of attitudes or Opinions from individuals, and groups, or the procedure of obesity in certain areas that become the research area so that the data obtained can explain the real conditions (Surya et al., 2018). The purpose of the research using qualitative data analysis techniques is done to achieve a result then used various methods of analysis of frequency distribution is done to process various data with a simple calculation tool to Know the amount of the difference and the percentage of data obtained. Data collected along with information about the waste in the district Manggala, the next stage conducted analysis related to the waste management system in the city of Makassar, especially in the Manggala district that became the location of research. Primary data is obtained directly from research objects or the location of research, with survey methods, direct observation of the field, and interview activities to obtain accurate data.

Surveying and field observations are conducted to measure and observe the feasibility of technical data so as to know directly the real conditions of the problems and obstacles that are being encountered. The interview was conducted against the officials and executive officers of the waste managers based on technical aspects, institutional and implementation of the field in landfills with observation methods and the awarding of the questionnaire. Description of regional characteristics, regional conditions, the potential amount of waste and waste management system in Manggala District, data from information directly obtained by respondents. As for the primary data used to explain the condition of the field consists of the data accumulation waste amount, management of the waste consisting of collecting phases, then transport and disposal at the end place, and other data factors that can affect the system of the managed trash. Implementation of this research is a study and education to the community through the development of waste schools and waste banks and the assistance program of waste processing can be done using the method of participation of the community. Educational activities that can be given to the group of citizens, consisting of the way of sorting waste, managing waste bank with entrepreneurial-based and

the mentoring of recycling process training so that it becomes a product that can be used again, The manufacture of compost fertilizer and various handicraft products until the provision of knowledge about processing waste into renewable energy.

Through the dissemination activity of the questionnaire conducted is to get related information needed with the condition of the culture, and the behavior of the community-related processing of waste, the real condition of waste. The sampling techniques in this study were conducted to retrieve sample data from existing research populations in the Manggala subdistrict. As for secondary data obtained through the results of reports and documentation, the report is data from the district office Manggala, while the method of data documentation is to collect data based on the documents, records, photographs of activities, files, or other written materials in the form of official documents and relevant to this research, (Saleh and Idris, 2019).

4. RESULT AND DISCUSSION

4.1. Waste Potential in Maggala District

Households as consumers in the process of economic activity are one of the smallest components that is a source that produces a lot of waste in the Manggala district with the largest volume. Consumers are one of the largest sources of food waste producers. To successfully reduce food waste associated with consumers, it is necessary to have a clear understanding of the factors affecting consumers perception and behavior related to food waste (Aschemann-Witzel et al., 2015; Trifonov et al., 2019).

The time of the waste generated by a household can be known by the magnitude of knowing the number of members in the household. With the increasing variety of waste generated this can cause problems when the disposal of waste is only relying on waste officers and lead to the disposal of waste, this occurs because of the extent of the capacity of the place's Waste disposal. Moreover, waste is only disposed of in temporary disposal, the waste that is on the disposal while dissipation out of place so that it can cause environmental pollution and health disorders. Therefore, it is necessary to process the waste treatment so that it can reduce the volume of waste until the final disposal. This underlies the feasibility of waste management supported by energy use and avoids the cost of environmental damage due to a large amount of waste, (Oliveira and Rosa (2003). Waste in the district Manggala very much so that has potential that can cause problems, waste dumped in the final waste disposal when there is no strategic step will cause overload and can be Environmental damage.

Potential waste in the district Manggala is quite large meaning a lot of waste generated by community which has not many methods used to reduce waste, this can be a problem for people and local governments. As a description of the potential of waste can be seen as follows (Table 1):

The size of the area Manggala district reached 24.14 km^2 with a population of 115.005 people, resulting in a large amount of waste because of consuming food, the amount of waste produced has not been managed properly. As for the waste generated by the community Manggala reached 343 m^2/day or 27.595 tons annually. Waste in the district Manggala is very large so it needs serious handling because if there is no management with a good system will result in the impact of changing the balance of environment and environmental pollution. During this time waste is done by getting a waste of this will add to the load in the final disposal, for it needs to be done development of waste management technology. One technology by knowing the framework by using network modeling technology so that the trade-off modeling system can be accessed through the Internet by stakeholders and decision-makers in the processing of waste, (Kraines et al., 2004; Vertakova et al., 2017). The technology of Internet use is very important in the process of waste processing so it can be a known type of waste and easy processing. Waste management needs to know some things, among others; (1) How the population and density levels of people, because each increase in population will be followed by a hike of the amount of waste generated by the community from the consumption activities, so it is necessary to handle waste to reduce Potential waste in the district Manggala. (2) The high level of activity, the activity of higher activities can influence the amount of waste generated by the community. (3) The increasingly higher pattern of life, i.e. the magnitude of consumption made by the community so that it is necessary to cooperate with the producers to limit the amount of public consumption and the role of the Government to provide regulation in Consumption activities based on needs.

Improved patterns of social-economic life of the community led to the increasing number of waste so that the composition can be known based on the material and the source of waste produced by the community, for composition can be seen magnitude The resulting volume is (Figure 1);

Waste in the district Manggala in composition gives a picture that the largest organic waste in generating waste is volume reaches 83.877 m^2 or a percentage of 60% of the overall waste in the district

Table 1: Household waste production in Manggala district

No.	Village office	An area (km^2)	Total population (life)	Waste production/day (m^3)
1.	Biring Romang	0.94	9,673	29.0
2.	Bangkala	2.83	14,634	42.9
3.	Batua	2.45	22,959	66.8
4.	Antang	2.63	10,627	31.8
5.	Bitowa	1.31	10,392	31.1
6.	Borong	1.92	16,427	49.2
7.	Manggala	4.44	20,324	60.9
8.	Tamangapa	7.62	10,969	32.9
	Total	24.14	115,005	343

Source: Manggala District Office, the Year 2019

Manggala, This waste generated from the process of consumption of people means very large community activities in terms of fulfilling the need so that it generates the rest of the consumption in the form of waste. The second most waste is plastic waste reaches the volume of 18.173 m^2 or 13% of the waste as a whole, this waste is very dangerous and has a very high environmental pollution rate it needs to be done very Serious about this waste. Plastic waste is waste that is not easily destroyed and many contain toxic substances that can damage the environment. Meanwhile, based on the most waste-producing waste data, the household reaches 25.039 tons in the year 2018 and the traditional market that is in the district Manggala generate waste of 365 tons, with the greater waste that Produced by households there needs to be educational so that the household can manage the waste before the end to the final disposal. The amount of household-generated samples can be seen in the existing data (Figure 2).

The environment can be clean from waste when there is concern from the community and all components, namely the institution of universities and Governments with the cooperation is carried out the program how to protect the environment so as to create an environment that has been done by higher education institutions in this area in the form of care as a form of devotion to the community in the form of waste schools and the assistance of waste banks, as one forms of education. Educational education needs to be more aggressive with scientific-based in taking waste management action by requiring everyone's involvement along the food supply chain, including policymakers, food producers, suppliers, and consumers Food, (Shafiee-Jood and Cai, 2016; Pellegrini et al., 2019).

Figure 1: Waste Composition at the Termination of Manggala, the Year 2019

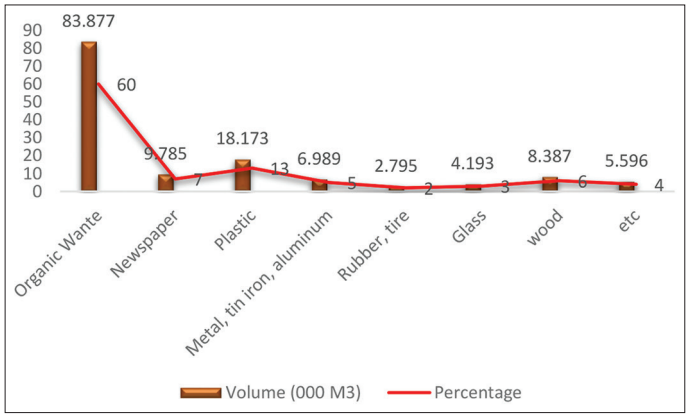
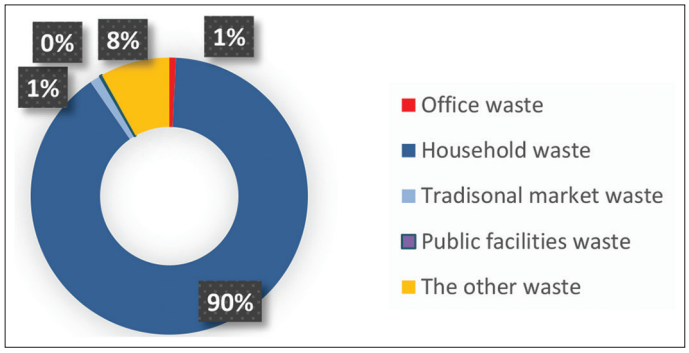


Figure 2: Waste Generating Sources in Manggala District, 2019



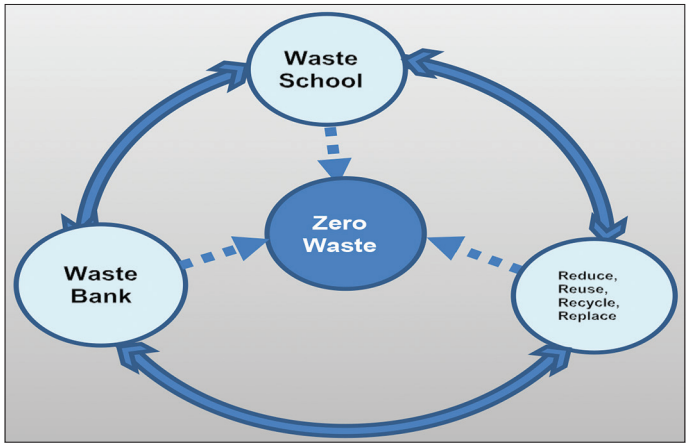
4.2. Sustainable Waste Management to Wards Zero Waste

Fulfilling the need for goods and services is one form of fulfilling the need in a sustainable manner means fulfilling the needs can be fulfilled without sacrificing the fullness and ability of the future generation can be fulfilled Needs. The continuing fulfillment of a need is a future-oriented principle and view, in order to be able to compete successfully in the global economy and maintain the social, cultural, political and environmental vitality in the broadest sense (Budiharjo, 2005). Waste handling needs to be managed sustainably, so that management is based on the potential of existing resources so as to maintain the environment, with the objective that can utilize resources economically and can Used as a renewable energy source. Domestic waste is a source of thermal, water, animal waste can also be the most important renewable energy source that is an underground energy storage, (Frijns et al., 2013; Pode, 2016; Korovin, 2018; Khalil et al., 2019). This means that waste handling needs to be managed sustainably and looking for alternative waste management. Alternative waste management activities should be able to solve all waste problems with various strategies so that the potential environmental pollution. The strategy is to create a waste school, waste bank and waste processing methods ranging from reducing, reuse, recycle and replace (4R), so that it can be achieved as zero waste.

College institutions in this area have a concern for the environment, especially about the waste problem, so that the school created waste means resources that exist in the institution of universities, especially at the University of Makassar Bosowa, have done various activities related to waste handling that is, create awareness, love the environment and jointly do waste collection. In line with opinions Bányai et al. (2019), About the process of collecting waste from downtowns as a cyber-physical system that is necessary to have an optimal assignment on the source of waste or waste for waste trucks, there needs to be scheduling waste collection through the routing of each waste truck to Minimizing the total cost of operations, improving reliability as a comprehensive environmental indicator that has a great impact on public health should be considered. Awareness and concern for the importance of the environment are determined by how good it thinks and behaviors as human beings. Community participation in maintaining the environment is necessary, by conducting various activities, namely invites each other from all citizens in the surrounding environment to keep the environment clean from waste, This role is incubated in the form of participating in the group of waste schools to help each other in maintaining the environment and to participate in the process of waste processing through recycling and no less important in the process of recycling through the 4R program waste can be reduced by planting organic waste so that it can become fertilizer family crops. The jam was changed how to think people how to manage waste through technology utilization so that waste can be reduced by participation and community participation (Figure 3).

The waste school also creates awareness of the waste from the home, so it is necessary to change the behavior of the citizens can be changed, this requires a variety of methods of approach slowly in order to change the habit. Behavior change is determined by

Figure 3: Waste handling framework in Manggala district



the level of public education and it is certainly not easy to do in a short time, a lengthy process is required. Society can change when the continuous approach is done through the provision of various knowledge about maintaining the cleanliness of the environment and social-cultural value in the community. Learning about waste, relating to character and habits. Because it is at an early age, children must begin to be taught, used and given examples to do the process of disposal of waste in the place that has been prepared, it is not easy to teach to do waste disposal and grime. But broadly, it needs to be given an understanding of where they should throw paper waste, plastic or the rest of the food. Results of the analysis of Di Talia et al. (2019), Explain the need to identify certain factors that cause a lot of waste and food waste in a region, and what actions can be taken by public and private stakeholders to reduce food waste and waste, so Less to the final place. However, it also emphasizes that family and environmental roles are also crucial in educating families to get used to wasting waste, reducing plastic use, and more. Awareness of the community is still lacking, so it is necessary to have awareness of how to create an environment that is free of waste.

The existence of waste schools can do education in creating awareness of waste, so also do learning to the people and groups in doing the selection of waste according to its kind. The waste from the community is a remnant of human needs that are not worn or disposed of, the process of activities and produced by nature and has not been economically beneficial. The waste sorting process is one of the processes in the processing of waste, by separating into certain waste groups, namely organic groups and non-organic groups. In the process of sorting waste is not instant, the need to do a variety of knowledge so faster sortin g of waste. Waste management in the district Manggala still follows the old system that has not changed with the lack of activities such as recycling activities and energy generation from waste. With the lack of waste processing methods then the amount of waste generated by the community is still increasing when there are no concrete steps in the form of appeal to the community, and encourage how to have participation in maintaining the environment Net of waste and the less trash that is in the final disposal. Opinion of, Nguyen et al. (2015); Akil, (2015), Mention that only by knowing what encourages people to participate in the separation of waste in the source and whether they are ready to cooperate or we cannot find the conditions and interventions that effectively maximize the cooperation For the implementation of waste separation programs. Integrated and good waste management is to achieve a target that is zero waste, the effort needs to be further improved overall from the waste management system by using various technologies to process the waste so that it can Reduce from year to year. This can be achieved when there is support from the government and the community widely, The government can issue regulations on landfill and provide various facilities in the form of the provision of waste carriers and human resources that transport waste. Another regulation is how waste that is in society before transported the final place must go through the process of sorting waste. Waste sorting is obtained by various types of waste ranging from Sampat that can be used again, waste as a source of energy, waste as fertilizer material and the last result of waste sorting is that transported to the final disposal so that the place The final disposal can be prevented. According to Czajkowski et al., 2014; Fan et al., 2019, have analyzed shows that a large group of people who are willing to sort the waste at the household level even if sorted waste will be collected at no additional cost, so that waste is easy to reprocessed after through sorting. Integrated we have to design it as a system alignment. School implementation Waste Besides teaching sorting waste also form a group with the name Makassar choose waste (MCW) Based entrepreneurial. Implementing a very important sorting program creates partnerships with various parties both private parties, Governments, and other social institutions. With the involvement of these parties such as the private party can be a companion in the processing of waste so that it becomes economic worth, many things can be done by the private sector in terms of moving in the energy industry, waste being managed by Large scale can be made in the form of energy as done by developed countries, investors are expected to be able to cope with waste in the district Manggala. The government can attract investors in the processing of waste by means of giving convenience to the investor in investing their capital, This facility in the form of provision of waste processing, ease in terms of taxation and facilities in terms of implementation of activities. It is hoped that the private sector in the industry should not develop products that are difficult to process for a long time so that it can pollute the soil. It is hoped that the private party should cooperate with the Government in the form of a 4R program initiative. According to Chen et al. (2011), the recycling process needs to implement technology so that it can contribute to the reduction of additional emissions that can pollute the environment. The implementation of recycled waste products existing in the District Manggala need good planning, after that implementation and evaluation, in the planning of the program should involve all the communities in the district Manggalan so that the Implementation is no barrier from society and got support. While the implementation is doing mentoring how to Mengola waste by implementing the program 4R is starting to reduce, reuse, recycle and replace, With this implementation through the assistance of the community in the district Manggala can understand it. As for the evaluation, stage is to see where the implementation of the program, the implementation of the program in the subdistrict is quite well done with the growing number of the groups and waste processors from 2018 only 10% Increased to 35%, this shows that people have a sense of awareness in preserving their environment and increasing their economy.

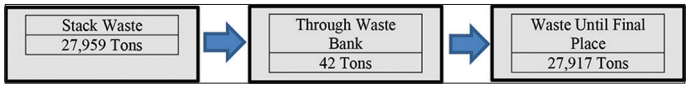
The waste management group can run well with the presence of household-based waste processing tools and waste can be managed properly. This processing mechanism reduces the volume of waste that can be recycled into the simplest form in a separate dustbin and is able to produce recycled products that are not contaminated, through the processing engine running automatically (Warsing et al., 1998). In Manggala district it self is less glance into a very profitable business from household waste, this is due to lack of counseling to the community or giving knowledge that waste can be useful and have economical value Recyclable goods or items that are usually produced into goods more useful. Waste processing tools are necessary in order to reduce or help the community in addressing the waste problem by using a tool that is composting machine. Composting process is not very difficult in the implementation, with this tool can reduce small household waste, other than that simple compost making machine can be applied in the household. Profit gained from the use of composting machine in the processing of waste very much IE can reduce existing household waste, increase the income because the waste has become fertilizer, and the results of composting can also produce energy for the community.

In addition to waste schools in waste, handling is also done activities waste Bank, waste sorting can support the success of hygiene programs and waste management. Without sorting, waste processing becomes difficult, expensive costs in maintaining the environment and high risk of polluting the environment and endangering health. Sorting is a separate type of waste that is one with the other, (Zhuo and Yan, 2019). The activity of dry waste collection is one of the activities of the waste Bank and has management like banking, waste bank activities are doing savings activities but in this case, it is not money, but the waste Generated by society. People who save in the form of savings are also called customers. Customers are given a book of savings and facilities gained by the public is able to borrow money when the community needs it and the money will be returned with waste for the money that has been borrowed. The saved trash is weighed and rewarded with some money that will be sold at a factory that has worked together (Pratama and Yusri, 2018). Data on waste time in Manggala district reached 27.959 tons of waste that until the end of the place reaches 27.917 tons in 2018 while processing through waste bank only 42 tons. It still needs further improved the implementation of waste schools, waste banks, and 4R activities.

Waste Bank activities are a way to turn waste into money while keeping the environment clean from waste to be reusable (Kusumantoro, 2013; Serranti et al., 2015). With the construction of a group of colleges, so created various waste bank groups in the district Manggala. Waste bank groups created by 15 groups and the contribution is given from waste management is able to increase the economy of the community, because of the waste that is sorted by the public and then to the trash bank then the manager Rate with the money gained by the Trash can group. In addition, waste in the processing site will be processed or recycled, the process of the management, incineration, and disposal of waste to the end place.

The handling of waste results through the concept of 4R (Reduce, reuse, recycle and replace) in the district Manggala, with the expectation that the waste generated can be reduced. The 4R program (Reduce, Reuse, recycle and replace) or community-based waste management has been implemented by community groups in the Manggala district. As the main actors, the community in the management of waste ranging from planning, forming, running and regulating waste management, then the role of community with local governments, indispensable. According to Quested (2011), consumer involvement and food producers to help consumers to buy the right amount, the amount of household food waste is reduced. The role of society plays an important role in the process of handling waste, so the program makes the area less waste can run. Waste managed by community-based in the district Manggala is having characteristics: (a) More productive means the managed waste can benefit the community both in terms of the economy and in terms of the creation of energy Renewable. (b) Independent, meaning it should not rely on government services, (c) create alignment in the processing of waste by applying the concept of 4R based on the creation of a Rama environment (Figure 4).

Figure 4: Waste Processing in Manggala District, 2019



One factor in the management of waste, so that the waste can be reduced from the role and existence of waste collector scavenger. The scavenger in the Manggala subdistrict has been empowered so it plays a role in the waste reduction process. The scavenger activity is sorting out the waste and then below into the waste, it is one of the processes to reduce the waste until the final disposal. If all the components in the handling of waste in the district Manggala can run well and sustainable then the fore Manggala District became a clean area and become a demonstration center, so the Makassar city government program to zero Waste will be achieved. In addition to the activities carried out by the flea who took the waste from the community, it will be added to the economic value of the sale process occurs waste. Thus the amount of waste dumped on the final disposal can be suppressed and only Nonorganic waste dumped so that the waste with the problems posed can be solved at the resident and make the city of Makassar Zero Waste in the year 2025.

5. CONCLUSION

The waste problem in the Manggala subdistrict has been handled by various means from the source to the trash disposal, so the environment in the damage can be minimized. The concept of handling waste done in the district Manggala has involved a college institution by forming its name Waste school, mentoring on the implementation of waste bank and mentoring on the implementation of the program 4R (reduce, reuse, recycle and replace). The waste school has provided knowledge to the public how to collect waste, sorting, processing and dispose of the correct waste so as not to damage the environment and through the processing of waste or in recycling, through job creation So that people can increase their economy, And the environment can be maintained and sustainable according to what is globally

programmed namely SDGs. Implementation of waste management concepts in the Manggala subdistrict became the pilot project, so the city of Makassar will go to zero waste.

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