

## APPLICATION OF SCIENCE AND TECHNOLOGY IN WASTE MANAGEMENT, DIGITAL MARKETING-BRANDING STRATEGIES, AND ACCOUNTING SYSTEMS FOR ENVIRONMENTALLY FRIENDLY FERTILISERS AND RECYCLED PRODUCTS

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### Article Info:

Received: 2024-04-29

Revised: 2024-05-30

Accepted: 2024-06-15

Volume: 3

Numbers: 2

Pages: 123 - 130

### Keywords:

Organic Waste,  
Inorganic Waste,  
Green, Digital  
Marketing, Accounting  
Software

### Abstract:

This PKM was carried out by the UMB team in partnership with the Nurul Yaqin Recitation Group, Parigi Baru Village, Pondok Aren District, South Tangerang, and was funded by DRTPM DIKTI through the PPM Grant Program for the 2024 fiscal year scheme. The Nurul Yaqin Recitation Group has 19 members; apart from being homemakers, they also have informal workers and small home industry businesses. This recitation group carries out its routine activities, namely conducting religious studies under the care of the DKM Masjid Baitul Mukminin. It is active in various community activities and can mobilize other community members through activities. Therefore, they have the potential to be pioneers among grassroots communities to change people's lifestyles for the better through the green movement in their area. The problems experienced by partners are: 1) the accumulation of organic and inorganic waste in the area around their residence has not been appropriately managed, 2) There is no utilization of business opportunities for compost and recycled crafts, 3) There is no accounting application system to record transactions and financial reporting from the production of liquid fertilizer and solid fertilizer and the recycling of inorganic waste. The solutions offered are: 1) Provide training and counseling related to processing organic and inorganic waste into valuable products 2) Provide training related to digital marketing strategies 3) Provide training related to recording transactions and financial reporting through accounting software applications.

## INTRODUCTION

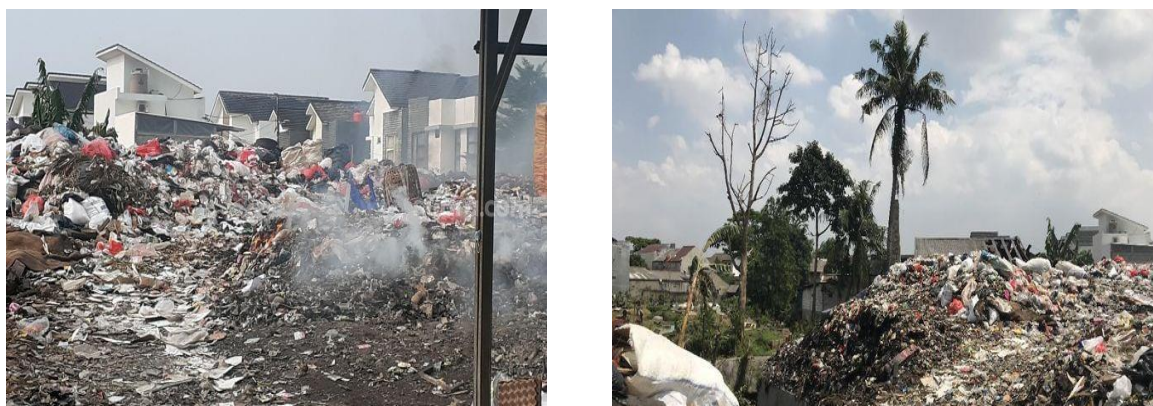
**Situation Analysis and Partner Issues.** Along with society's development, the South Tangerang City government continues to improve infrastructure to support comfort in the living environment. However, waste management is still a problem in the community, mainly due to the behavioral factors of people who still need to be disciplined in disposing of waste and the government's absence of good waste management. It is recorded that the amount of waste produced per day is 1000 tonnes (<https://www.idntimes.com/>). This is in line with the phenomenon faced by Indonesia and the world today regarding environmental pollution caused by the accumulation of chemical and plastic waste (Nurfritiana & Imaningsih, 2021). To overcome these problems, it is necessary to have knowledge and individual and community awareness of the importance of environmentally friendly or green behavior as a community movement to save the environment (Anggraini & Imaningsih, 2023).



Organic waste comes from nature or is produced from natural activities. In general, the most abundant component of waste in several cities in Indonesia is plant residues, which reach 80-90% and sometimes even more (Samitra, 2021). Therefore, using technological innovation, one way to handle it is to process it into environmentally friendly fertilizer (Moslehpour, 2023). The next type of waste is inorganic waste. One way to overcome the waste problem is to recycle it into other valuable items (Rosdiana & Wibowo, 2021). The definition of recycling here is using used goods to be reused into valuable items or processed into useful and economically valuable goods (Kieso et al., 2017). Thus, environmental pollution due to plastic waste can be minimized.

The problem of waste management also occurs in the community of households in Parigi Baru urban village. Environmentally friendly movements, such as waste banks and processing waste into fertilizer and other valuable materials, have yet to become a way of life for the community. Even the phenomenon of garbage piling up around the neighborhood is still widely seen.

The following is a picture of waste accumulation in Parigi Baru urban village, Pondok Aren sub-district, South Tangerang.



**Figure 1.** Piles of rubbish in Parigi Baru urban village, Pondok Aren sub-district, South Tangerang.

One of the best alternatives to tackle the waste problem is recycling (Fazmi & Imaningsih, 2023). This is done by separating waste into organic and inorganic bins to be processed into useful and economically valuable products. The expected impact of this behavior is to contribute to preventing environmental pollution and helping the movement to love the environment (Qomariah & Prabawani, 2020).

Such environmentally friendly behavior should be carried out by all components of society, both formal and informal sectors. Informal groups in the community, such as recitation groups, can be a driving factor for green behavior. However, in reality, they are still untouched by the socialization conducted by the government. Even though they are informal and have no legal entity, recitation groups have great potential to encourage an environmentally friendly movement and improve the economy through MSMEs. Therefore, academics must intervene to conduct socialization activities in the form of waste management training so that it becomes a product that has benefits and economic value.

One of the community groups active in social activities in the Tangsel area is the Nurul Yaqin recitation group. The group in Parigi Baru was established on 1 September 2015. The Nurul Yaqin group has 19 members who work as housewives and informal workers. The group conducts religious studies under the care of DKM Masjid Baitul Mukminin, Parigi Baru Village, Pondok Aren

Sub-district, South Tangerang. They have been active in various community activities and can mobilize other community members through their activities. Therefore, they have the potential to be pioneers among grassroots communities to change people's lifestyles for the better through an environmentally friendly movement (green) in their area.

The community service activities that will be implemented as part of the green movement involve waste management, which is processed into useful and economically valuable products (Setiyawati et al., 2023). So, it is hoped that the existing groups in the community can be fostered into the forerunners of MSMEs that help drive the community's economy through environmentally friendly product commodities (Ramli et al., 2024).

This community service activity (PKM) will begin with each group member sorting organic and inorganic waste. Organic waste will be processed into liquid and solid fertilizers, branded and sold to the community. Meanwhile, inorganic waste will be recycled to make practical items such as tissue holders, bags, plastic mats, plastic flowers, and other aesthetic handicraft products, which will be sold to the community.

The results of this PKM product are liquid fertilizer, solid fertilizer, and handicrafts from inorganic waste recycling. Environmentally friendly products are high-value today amid a society that is beginning to realize the importance of protecting the environment (Erna et al., 2023). Therefore, it is expected to be a useful and economically valuable product. Furthermore, digital marketing strategies will sell environmentally friendly fertilizers and handicrafts made from recycled materials. Digital marketing is an essential marketing tool today and is very helpful for MSMEs in developing their business ventures. (Shiratina et al, 2023)

From this training, the recitation group will pioneer itself into MSMEs to empower its members economically. Financial reporting systems are also crucial in conducting small and medium enterprises (Setiyawati et al., 2023). Therefore, special training will be provided related to financial and accounting systems through simple accounting records so financial reporting can be more accurate and reliable that it fulfills the characteristics of a financial report, namely relevant, reliable, comparable and timelines (Sendjaya et al., 2022). Based on the problems described above, it is necessary to carry out community service activities with the topic "PKM Kelompok Pengajian Nurul Yaqin Kelurahan Parigi Baru, Pondok Aren District, South Tangerang - Application of Science and Technology in Waste Processing, Digital Marketing-Branding Strategies, and Accounting Systems in the Implementation of MSMEs Environmentally Friendly Fertilisers and Recycled Products."

**Partner Issues.** Based on the situation analysis described above, the partner's problems are stated as follows:

1. The accumulation of organic and inorganic waste needs to be appropriately managed. Members of the Nurul Yaqin recitation group in Parigi Baru Village, Pondok Aren District, South Tangerang, collect organic waste and will be given training on making products from organic waste into liquid fertilizer and solid fertilizer. Meanwhile, inorganic waste will be processed by recycling it into useful and economically valuable handicraft industrial goods.
2. The average recitation member is a housewife and informal sector worker, so their economy needs to be improved through the entrepreneurship of environmentally friendly fertilizers and handicrafts. They need to be taught about entrepreneurship opportunities through digital marketing. Therefore, there is a need for Digital Marketing Strategy-Branding training to reach the broadest possible market in the sale of environmentally friendly fertilizer products and recycled handicraft products.



3. There is no accounting application system to record transactions and financial reporting from the production of liquid and solid fertilizer and recycled handicrafts. The Nurul Yaqin recitation group members in Parigi Baru Village, Pondok Aren Sub-district, South Tangerang, will be trained to record financial transactions and simple accounting using accounting software applications.

To overcome these problems, the UMB PKM Team has implemented several solutions, including assisting in processing organic and inorganic waste. This is done by training members of the recitation group on how to use composters that produce liquid and solid fertilizers. In addition, assistance will be provided in the form of appropriate technology tools and instructions on using them. As for managing inorganic waste, training will be provided on processing inorganic waste into recycled handicraft products such as tissue holders, bags, plastic mats, plastic flowers, aesthetic glass lids, and other useful and economically valuable handicraft items.

They will then be taught to digitally brand their products and market their fertilizer and handicraft products using an online marketplace platform. This service activity will also provide assistance in preparing an accounting application system for recording transactions and financial reporting with complete features for trading and manufacturing businesses.

From some of the problems identified in this program, alternative solution concepts will be offered as follows:

1. Providing learning and counseling assistance and training to the Nurul Yaqin recitation group, Parigi Baru Village, Pondok Aren District, South Tangerang, to process organic waste using a composter that produces liquid and solid fertilizer. The PKM team provides assistance in the form of appropriate technology tools and instructions on how to use them. Learning will be carried out by a team of lecturers and students of Universitas Mercu Buana, accompanied by an exceptional trainer.
2. Provide learning and counseling assistance and training for manufacturing inorganic waste recycling into valuable products such as tissue holders, plastic mats, etc., which will be sold to the community. A team of lecturers and students of Universitas Mercu Buana, accompanied by a particular trainer, will carry out the learning.
3. Provided training on digital branding and marketing of environmentally friendly fertilizer to the Nurul Yaqin recitation group of Parigi Baru Village, Pondok Aren Sub-district, South Tangerang.
4. Assist in preparing financial and accounting reports for recording transactions and financial reporting with complete features using innovative cashier software.

## METHODS

The role of partners in this activity determines its smooth running. Therefore, it is necessary to have good coordination and understanding between the Implementation Team and Partners. The partners in this case are the Nurul Yaqin recitation group, Parigi Baru Village, Pondok Aren District, and South Tangerang City. Partners followed all directions from the PKM Team and participated in learning, training, socialization, and implementing the making of liquid and solid fertilizers from waste processing and doing digital marketing. Partners were also taught about applying digital marketing strategies to market their environmentally friendly fertilizer products and recycled handicrafts. In addition, partners are also taught to use simple financial reporting and accounting applications through "smart cashier" software.



After a series of activity processes were carried out, the team evaluated the partners. The evaluation process consists of:

1. Partners' ability to understand modules on how to make liquid fertilizer and solid fertilizer from organic waste and recycled crafts, determining product selling prices, branding, and marketing products with digital marketing, and understanding accounting modules using accounting software.
2. Partners are expected to be able to apply the manufacture of liquid fertilizer and solid fertilizer from organic waste and recycled crafts, know how to market products with digital marketing and process financial and accounting reports using accounting applications.
3. Partners are expected to sustainably make liquid and solid fertilizer from organic waste and recycled handicrafts, market products with digital marketing, and process financial and accounting reports using accounting software applications.
4. Analyse and evaluate the shortcomings and obstacles during the PKM activity process, including making liquid and solid fertilizer from organic waste and recycled crafts, marketing products with digital marketing, and the financial reporting process using accounting software applications.
5. Improve and advise on the shortcomings during the PKM process, namely in making liquid and solid fertilizer, recycled crafts, knowing how to market products with digital marketing, and financial reports using accounting software applications.
6. Develop products using digital marketing strategies and branding strategies, namely, giving brand names and green labels and perfecting financial and accounting reports using accounting software applications.

## RESULTS AND DISCUSSION

On 28 July 2024, the PKM Team and resource persons were present at the PKM location, namely in Parigi Baru village, South Tangerang. PKM activities began with a ceremonial opening of the PKM event by the head of PKM and the head of the Nurul Yaqin Recitation group, as well as the handover of training equipment and materials.

Furthermore, the PKM Team and resource persons presented the training material on making liquid fertilizer from organic waste and then practiced it with the participants. Organic waste that has been separated is then chopped using a chopping machine and knife. After the material is ready for processing, a composition consisting of 70% wet and 30% dry organic waste is added to the composter machine (Arwati et al., 2020). This composting process requires a starter material, namely EM4 or Boischa (Sidabalok et al., 2014). The liquid is dissolved in sugar water and stored in a closed container for several days until it ferments. Only then is it put into the composter, and organic waste is ready to be composted. (Arwati et al., 2021). The mixing process takes about 21 days, with a break every three days when the composter window is opened. Thus minimizing the amount of gas produced (Salim et al., 2021).

The composting process produces two types of organic fertilizer: liquid and solid. Liquid fertilizer is a liquid concentrate produced from the fermentation process of organic waste. Since it is a concentrate with a high mineral content, liquid fertilizer must be dissolved with water before use. The recommended ratio between liquid fertilizer concentrate and water is 1:10 and 1:20 (Arwati et al., 2021). The solution will then be practical as an organic liquid fertilizer, which is helpful for soil fertility and makes plants healthy.



Meanwhile, solid fertilizer is the second type produced from the composting process. It is the dregs of the fermentation process in the composter. This solid fertilizer also contains many mineral substances beneficial for soil and plants. It can also be directly mixed with planting media as a medium for growing crops. Below is a photo of the process of processing organic waste into compost.



**Figure 2.** Making compost fertilizer

The next training was handicraft making with recycled materials, namely used product packaging and leftover patchwork. Products made include tissue holders, bags, wallets and beautiful placemats. In this PKM activity, an example of making placemat products is exemplified with the remaining patchwork. The tools and materials needed are scissors, hot glue, measuring meter, cup lids and coasters, and leftover patchwork with various motifs. The PKM team and resource persons directed and practiced the craft directly. The participants followed enthusiastically and made beautiful coasters layered with patchwork. Below is a photo documentation of the activity.



**Figure 3.** Making handicrafts

Furthermore, the PKM team and resource persons provide training that is quite important for participants, namely digital marketing training. The PKM team taught participants the importance of using digital marketing to sell products. In the training, participants were guided to create a digital marketing platform account. Participants tried to follow and succeeded in following the stages of creating a Shopee account. Through this training, it is hoped that it will be helpful as a tool

to market and sell the products produced. Armed with their respective smartphones, the participants followed this training and immediately practiced it.

The last training is the application of finance with a simple accounting system using the "Kasir Pintar" software application. From this training, PKM participants are expected to recognize the importance of financial reports and accounting in a simple way and practice it when running an MSME business.

## CONCLUSION

PKM activities at the Nurul Yaqin Recitation Group, Parigi Baru Village, Pondok Aren District, South Tangerang, were carried out on 28 July 2024. The targets that have been planned at the beginning of the PKM have also been achieved, namely:

1. Training on processing organic waste into environmentally friendly liquid and solid fertilizer
2. Training on making handicrafts from inorganic waste, such as used patchwork, into aesthetic products.
3. Training on marketing and selling products through digital marketing applications.
4. Training on creating financial and accounting reports using accounting software.

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