

# Utilization of Horticultural Waste as a Jumputan Batik Dye at MSMEs Wong Kito Gallery

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## Utilization of Horticultural Waste as a *Jumputan* Batik Dye at MSMEs Wong Kito Gallery

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**Abstract:** The purpose of this research is to find out and analyze the use of horticultural waste as dyes in the manufacture of natural batik in MSMEs Galeri Wong Kito Palembang city. The research was conducted from September 2023 to February 2024 at MSMEs at the Wong Kito Gallery, Palembang City. The methods in this study were 1) Observed directly to the MSMEs of the Wong Kito Gallery to see the batik production process and the use of horticultural waste dyes, 2) Interviews with batik owners and artisans at Wong Kito Gallery to get information about dyeing techniques, 3) Literature Study. Data Analysis was carried out descriptively data in the form of tables, graphs, and qualitative analysis to conclude the effect of natural coloring on the quality of batik based on the results of interviews and observations. The result of this paper were 1) The Pesona Sriwijaya Group is committed to sustainability by strengthening the community and being an example in CSR programs that are not only socially and environmentally responsible, but also provide concrete benefits for people's daily lives. The synergy and collaboration between five groups (Keramasan Crafter, Bukit Crafter, Aksara Group, Indonesian Disabled Women's Association (HWDI), Hijrah), all of which were fostered by Wong Kito Gallery MSMEs, was the foundation for cultural preservation and economic empowerment. Through the Palembang CINDO (Clean batik inative for Indonesia) initiative, which has used batik dyes from horticultural waste and food residues, 2) Residues from gambier extract or gambier, has the lowest percentage, which was 8.20% of the total waste used. On the other hand, the highest percentage was found in "Bananas rotten/not harvestable" waste, reaching 24.48%. 3) Types and Utilization of Horticultural Waste for Dyeing Batik *Jumputan* at MSME Gallery Wong Kito utilizes 4 types of waste, namely Shrimp Shell Dregs, Residues from gambier extract, Leaves of Ketapang, Coconut fiber, Peels and leaves of Agarwood to get a unique motif to preserve ancestral traditions. Suggestion is The need for a waste management strategy by involving the coordination and role of SOEs, the community and academics in collaborating to minimize the disposal of horticultural waste as a useful resource.

**Keywords:** MSMEs, horticultural Waste, Batik, natural dye, local cultural

### 1. Introduction

Batik is a traditional Indonesian textile art that is rich in beauty and cultural meaning, becoming a symbol of national identity and pride. Batik is a craft that UNESCO has recognized as a world heritage. So, it can be an excellent example for the development of SMEs or companies that focus on various crafts and arts [1] Especially in Palembang City, the name is *Jumputan Batik*. However, the use of chemical dyes in the batik process has presented serious challenges to the environment and health, as they contain toxic ingredients and require high water consumption in the production process [2]. Batik is a textile adorned with wax motifs that do not discolor throughout the dyeing process. It keeps color out of the covered sections of the fabric.

The melted wax is sprayed to the fabric with a small spray sprayer called a canting, which is made of copper affixed to the end of a light four-

inch hardwood or bamboo handle.

Efforts to use natural dyes derived from renewable sources are increasing. One of the potentials is the use of horticultural waste such as fruit peels, leaves, and plant stems as natural dyes for batik (Gage et al., 2024). This approach not only reduces [3] but also provides an environmentally friendly alternative to synthetic dyes.

The advantages of using horticultural waste in MSMEs are reducing environmental impacts by replacing chemical dyes with horticulture, empowering the community through collaboration with local farmers and horticultural entrepreneurs, increasing income for the community, revitalizing local culture and wisdom, actively promote and encourage a creative and in-novative culture will lead to performance improvement [4], also can increase the competitiveness of MSMEs in the domestic

and foreign markets.

Pesona (Plant-based recycling on Ecoprint Innovation) Sriwijaya is one of PT PLN Indonesia Power UP Keramasan's flagship CSR programs. Pesona Sriwijaya is a program formed in 2020 that was formed from existing potential. Pesona Sriwijaya is a synergy and collaboration of five groups and communities, namely Keramasan Crafter, Bukit Crafter, Aksara Group and the Indonesian Disabled Women's Association (HWDI), and the Hijrah Group (prisoners of the class IIA Women's Correctional Institution of Palembang City), where these five groups are fostered by the parent group called MSMEs Galeri Wong Kito (GWK). Pesona Sriwijaya has the specialty of using natural dyes in making the jumpatan batik typical of Palembang City.

Based on the description above, the purpose of this research is to find out and analyze the use of horticultural waste as dyes in the manufacture of natural batik in MSMEs Galeri Wong Kito Palembang city.

## 2. Methods

The research was conducted from September 2023 to February 2024 at MSMEs at the Wong Kito Gallery, Palembang City. The methods in this study were 1) Observed directly to the MSMEs of the Wong Kito Gallery to see the batik production process and the use of natural dyes. Record the types of horticultural waste available and used, 2) Interviews with batik owners and artisans at Wong Kito Gallery to get information about dyeing techniques, 3) Literature Study. Data Analysis was carried out descriptively data in the form of tables, graphs, and qualitative analysis to conclude the effect of natural coloring on the quality of batik based on the results of interviews and observations. Identify the obstacles and advantages in the use of natural dyes from horticultural waste.

The data used were primary and secondary data. The primary data in this study was data obtained directly through direct observation in the field and face-to-face interviews with MSMEs, namely in the form of total members of the Sriwijaya Group, percentage of horticultural waste, types and functions of waste needs and environmental conditions as well as existing conditions about batik. Secondary data includes information related to the number of groups and the total pile of garbage.

## 3. Results and Discussion

### Background of the members of Pesona Sriwijaya Group

The Pesona Sriwijaya Group is a forum that brings together and strengthens relationships between individuals in the Wong Kito Gallery MSMEs. A comprehensive overview of the total number of group members, categorized by various demographic and background factors can be seen in Table 1.

Table 1. The total number of members in the Pesona Sriwijaya Group which is categorized based on various demographic factors.

Table 1. Total members of Pesona Sriwijaya Group

No	Group Name	Number of Members	Joined Year
1.	Keramasan Crafter	21 persons	2019
2.	Bukit Crafter	42 persons	2020
3.	Aksara Group	16 persons	2022
4.	Indonesian Disabled Women's Association (HWDI)	14 persons	2023
5.	Hijrah	20 persons	2024
<b>TOTAL MEMBERS</b>		<b>133 persons</b>	

Source: Author's Processed Data

The Table 1 showed that the Bukit Crafter Group has experienced a significant increase in the number of members since the year it joined in 2020. This reflects a strong interest in the development of creativity and crafts within this community. As one of the newest groups to join in 2024, Hijrah is showing positive initial growth with 20 members. Their participation shows great interest in enriching social and cultural diversity in the community.

Total of 133 members from five groups, Pesona Sriwijaya has shown that it were an inclusive forum for various groups to collaborate, and promote Sriwijaya's cultural heritage. This data reflects not only the growth of the community, but also the diversity in the backgrounds, interests, and goals of its members. This showed that the importance of communities such as Pesona Sriwijaya in maintaining and developing local cultural wealth through continuous collaboration. This cultural creative industry can improve

traditional industries, economic efficiency and market competitiveness [5] [6].

### Karakteristik Pesona Sriwijaya

Pesona Sriwijaya is one of the flagship programs in *Corporate Social Responsibility* (CSR) of PT PLN IP UP Keramasan. This program was established in 2020 by utilizing the potential available in Lorong Setiawan, Bukit Lama Village, Ilir Barat 1 District, Palembang City. This potential, if utilized optimally, has great potential to solve social problems in society.

Pesona Sriwijaya benefits from horticultural waste, food waste, and housewives' leisure time to overcome environmental problems, especially in the use of these wastes as natural dyes [7]. Thus, Pesona Sriwijaya empowers housewives to increase their productivity and family income, as well as make a positive contribution to protecting the environment.

This program was beneficial for preserving ancestral traditions by developing and using natural dyes. Pesona Sriwijaya was expected to be sustainable in empowering the community and become an example of a CSR program that not only fulfills social and environmental responsibilities, but also provides real benefits for people's daily lives. Synergy and collaboration between five groups or communities, namely Keramasan Teachers, Keramasan Crafter, Bukit Crafter, Aksara Group, Himpunan Wanita Disabilitas Indonesia (HWDI), and Hijrah Group fostered by Wong Kito Gallery (GWK), became a strong foundation in running this program.

### Percentage of Horticultural Waste, Population and Waste Generation

Since April 2023, PT PLN IP UP Keramasan has established a liquid waste treatment facility known as the Pesona Installation. In October 2023, the city of Palembang was engulfed in thick haze due to forest fires and fires at the Sukawinatan Final Disposal Site (TPA). This fire was a serious problem because the capacity of the landfill was not able to accommodate the abundant amount of household waste, horticultural waste, and other waste. As a high-end MSME that cares about the environment, Pesona Sriwijaya Group initiated a program to reduce horticultural waste and domestic waste at the nearest landfill by developing the Clean Batik/Natural Batik program. This program used natural dyes derived from horticultural waste or food waste [7]. The percentage of horticultural

waste in South Sumatra Province every year can be seen in Table 2.

Table 2 Percentage of waste in various regions every year in South Sumatra Province

	2019	2020	2021	2022	2023
Horticultural waste generation (%)	53,1	43,26	46,74	46	55,75

Source: [8].

Data showed that the percentage of horticultural waste disposal has varied over the last five-year period in South Sumatra Province. In 2019, it recorded the highest percentage with 53.1%, which then decreased in 2020 and 2021, before experiencing a sharp increase in 2023 to 55.75%.

A significant increase from 46% in 2022 to 55.75% in 2023 indicated a major change in the amount of horticultural waste produced. This can be due to factors such as increased agricultural production or changes in waste management practices. Horticultural waste as an environmentally friendly natural dye [9], if not managed properly can result in negative impacts on the environment such as soil and water pollution and public health problems. Therefore, there is a need for a more effective and sustainable waste management strategy, as well as the role of state-owned enterprises PT PLN Indonesia Power, academics and the community in collaborating to minimize the disposal of horticultural waste as a useful resource.

The amount of waste produced per day in Palembang City is estimated to reach 700 tons, with the percentage of organic waste reaching 68.12% and non-organic waste of 31.88%. The Service has as many as 1,229 personnel serving a total population of 1,150,000 people. Of the total waste generation, around 450-500 tons are transported every day. However, there are still around 200 tons of waste per day that must be managed. The generation of this waste not only causes economic losses, but also requires additional costs for its management and disposal. According to [10] Rapidly growing Municipal Solid Waste amounts in the low- and middle-income countries can be ascribed to the fast economic development and increasing population and urbanization in these countries.

Effective waste generation management This is closely related to the number of residents of a city or region. Solid waste management will be impacted by the huge amount of solid waste to be disposed of in densely populated areas [11], so The larger the population, the greater the challenge in managing waste so that it is not only efficient but also environmentally friendly The number of population and total waste generation in Palembang City in 2017 can be seen in Table 3.

Table 3. Population and total waste generation

No	District	Total Population	Amount of Waste Generation (m <sup>3</sup> )
1	Iilir Timur II	170.192	425,48
2	Seberang Ulu I	157.933	394,83
3	Iilir Barat I	118.671	296,67
4	Sukarami	104.700	271,75
5	Kalidoni	94.795	236,98
6	Seberang Ulu II	91.933	229,83
7	Kemuning	88.331	220,83
8	Plaju	85.464	213,66
9	Iilir Timur I	83.409	208,52
10	Kertapati	82.520	206,30
11	Sako	72.396	180,99
12	Alang-Alang Lebar	72.094	180,23
13	Iilir Barat II	66.966	167,14
14	Gandus	52.973	132,43
15	Bukit Kecil	49.522	123,80
16	Sematang Borang	25.148	62,87
<b>TOTAL</b>		<b>1.417.047</b>	<b>3.542,62</b>

Source: [12]

Table 3 showed that the districts with the largest population in Palembang City show a significant volume of waste generation. Iilir Timur II, with a population of 170,192 inhabitants, produced about 425.48 m<sup>3</sup> of waste. Seberang Ulu I, which has a population of 157,933 residents, produced about 394.83 m<sup>3</sup> of waste. Meanwhile, Iilir Barat I (the location of Galeri Wong Kito MSMEs), with a population of 118,671 residents, produced around 296.67 m<sup>3</sup> of waste. This number can still increase because the population will always increase every day, so the amount of waste produced will also increase. This data illustrates that the higher the population in a district, the greater the volume of waste produced, emphasizing the importance of effective and sustainable waste management infrastructure to face the challenges of urbanization and rapid population growth. This is in line with the opinion [13] that Population

increase, rapid urbanization, booming economy, and the rise in the standard of living in developing countries have greatly accelerated the rate, amount and quality of the municipal solid waste generation and 15% from the food waste.

Horticultural waste occurred when plants cannot carry out their functions properly. In the midst of the current serious problem of global warming, various steps need to be taken to overcome this problem. One of them is by reducing the amount of waste or garbage. Abundant availability, low cost, and eco-friendly and biodegradable properties are the advantages of horticultural waste[14] , horticultural waste such as gambier, ketapang, agarwood, coconut, and bananas were used as dyes for batik. In addition, food waste such as shrimp shell pulp is used in the mordanting process to add color. Some research on the use of horticultural dye like gambier coloring for batik have produced a fairly high color intensity, good color,fastness, and higher tear strength than syntetics [15]

#### Types and Utilization of Horticultural Waste for *Jumputan Batik* Dye

The problem of horticultural waste and food waste that only accumulates in landfills without being used around the environment, inspired Pesona Sriwijaya to reduce this waste by turning it into natural dyes for batik (*Clean Batik or Natural Batik*). This program is known as **Palembang CINDO (Clean Batik Initiative for Indonesia)**.

The percentage of distribution of horticultural waste/food waste based on its type required for the jumputan batik dyeing process at Wong Kito Gallery can be seen in Figure 1. Figure 1 has shown the variation that significant in the percentage of waste needed for the batik dyeing process. "*Residues from gambier extract*" or gambier, has the lowest percentage, which was 8.20% of the total waste used. On the other hand, the highest percentage was found in "*Bananas rotten/not harvestable*" waste, reaching 24.48%.

Gambier, which is a residue from the gambier extraction process, is needed in relatively small quantities in batik dyeing. This is due to the high concentration of natural dyes produced from gambier, Gambier liquid waste contains high tannins of 38%, so it is

suitable for dyes[16]. Then, the monthly requirement is not as much as other wastes that require larger volumes.

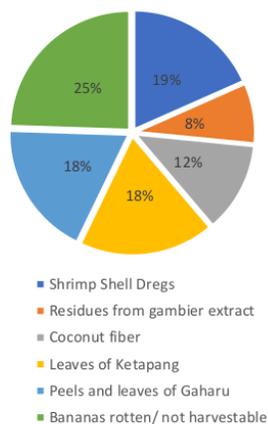


Figure 1. Percentage Distribution of horticultural waste/food waste based on its type required for the *jumputan batik* dyeing process every month at the Wong Kito Gallery.

*Rotten/ not harvestable bananas* can be easily found in large quantities due to their nature that often does not meet standards for human consumption, or because of damage during storage and transportation processes. This makes the collection of banana waste more and easier compared to gambier waste produced in a more limited volume from the extraction process. Each type of waste has a different role in the batik dyeing process, both in terms of providing color and in specific or limited uses. Different types of natural dyes have been tested as potential low-cost materials [17] ; [18] and imparting flexibility and adaptability [19].

In practice, the selection of the type of horticultural waste to be used in batik dyeing is also influenced by factors such as local availability, waste collection and treatment costs, and the sustainable use of natural resources. Therefore, even though the percentage required for gambier is relatively low, the waste still has important economic and ecological value in the batik dyeing industry.

Table 4 presents the types of horticultural and food wastes utilized in the batik dyeing process, detailing their respective functions, required quantities per month, and associated costs. Table 4 presents the types of horticultural

waste and food waste used in the batik dyeing process, along with their respective functions, the amount needed per month, and the purchase cost including transportation costs. Waste such as shrimp shell pulp is used as a color enhancer (mordanting), while the rest of the gambier extract acts as a producer of dark brown color. Coconut fiber and ketapang leaves are also used to produce light brown to bright yellow colors in this process.

Coconut coir can produce a variety of colors based on pH, and the results are good and can be widely used in the textile industry [20]. Coconut leaf extract produces a variety of colors on each batik [21].

Table 4. Type and Function of Horticultural Waste / Food Waste type and function for *Jumputan Batik Dye*

No	Type of Horticultural Waste / Food Waste	Function	Quantity required /month	Purchase Cost (including transportation cost)
1	Shrimp Shell Dregs	Color enhancer (mordanting)	30 kg	Free
2	Residues from gambier extract	Dark brown color producer	13,4 kg	Rp 13.500.000,
3	Coconut fiber	Light brown color producer	20 Kg	Free
4	Leaves of Ketapang	Bright brown/yellow color producer	30 Kg	Free
5	Peels and leaves of Gaharu	Light brown color producer	30 Kg	Free
6	Bananas rotten/ not harvestable	Indigofera color producer (green - blue)	40 Kg	Free

#### The Material and Processing Of *Jumputan Batik* with horticultural dyes

The batik produced at MSMEs Galeri Wong Kito is a type of *jumputan* that is

generally used for formal and informal traditional clothing in Palembang and can be applied as tablecloths, bags, pencil cases, or curtains. The process of making *jumputan* batik involves several materials and tools, including a clean-washed white fabric, nylon yarn or fine cotton yarn to bind, wax or paraffin to protect areas of the fabric that do not want to be dyed, as well as textile dyes. The high demand for water in the production process of Pesona Sriwijaya for the manufacture of *jumputan* batik, along with the lack of post-production liquid waste treatment, has become a serious problem for these MSMEs.

Table 5 showed the tools and materials required to create Natural Batik or Clean Batik, detailing quantities needed for producing 20 batiks. These include dimordant materials like Soda Ash and Alum for achieving vibrant colors, clean water for washing and removing residual wax, and natural dyes such as Coconut, Ketapang, Agarwood, Banana, and Shrimp shells used as coloring agents

Table 5. The Materials and Function for Process of *Jumputan Batik*

No	Materials	Amount of	Function
1	Dimordant Material Soda Ash Alum Mixture of Tohor (10 Lime and Conifers)	500 gr 500 gr 1 Kg 10 pack (10 liter)	Produces good color flatness and sharpness / color locking
2	Clean Water	20 liter	As an adonana mixture, washing and removing the remnants of batik night that are still attached
3	Gambier Extraction Water	2 – 3 liter	Natural dyes and can be used continuously but in the second use and so on the color is not so intense.
4	Coconut, Ketapang, Agarwood, Banana, Shrimp	Sesuai Kebutuhan	Natural dyes
5	Mori fabric	3 meter (1 batik)	Batik painting place

6	Stainless Steel vessel	3 pieces	Color dyeing process place
7	Canting	40 canting	To write (paint the liquid night), make the desired batik motifs
8	Kompur Batik Listrik	2 unit	Melt the wax used in batik making
9	Filter	2 pieces	Filtering the previously melted wax.
10	Batik wax	1 beam (250 gram)	To cover certain parts so that they are not exposed to the dye
11	Table for batik stamping	1 pieces	To make batik patterns (memola)
12	Canting for batik stamping (according to typical Palembang motifs: Ampera Bridge, Belido Fish and Songket Motifs)	As needed	5-6 for stamped batik 40 for written batik canting

Source: Data processed by the author

The data listed in Table 5 showed that the materials and equipment for making natural Batik or *jumputan batik*, as well as the stages and components required in this process. Materials such as Soda Ash, Ash, and Alum serve as crucial dimordants in mordanting, which was the process of locking color in fabric fibers. Proper use of this dimordant is important to achieve the desired brightness and sharpness of colors in Batik. In addition, a mixture of Tohor consisting of lime and resin from conifers was used as a mixture of dough to clean and remove the remaining batik on the fabric before the dyeing process. This prepares the fabric well to receive color at a later stage.

The process of making *Jumputan Batik* also relies on the use of a significant amount of clean water. Clean water was not only used to wash and clean the rest of the batik night, but also played an important role in maintaining the clarity of the color at every stage of the dyeing process. In addition, natural ingredients such as gambier extraction, coconut fiber, ketapang leaves, agarwood, bananas, and

shrimp shell pulp are used as natural dyes that give Batik unique color characteristics. The use of these materials reflects Indonesia's natural richness which is traditionally processed to create motifs and colors on Batik fabrics.

Equipment such as stainless steel containers for a safe dyeing process and canting for painting batik motifs in detail cannot be ignored either. Canting, with a total of 40 units, was used for writing (painting with night) and creating batik motifs according to the desired design. In addition, the use of electric batik stoves and filters to dissolve and filter batik wax ensures quality and precision in covering certain parts of the fabric so that they were not exposed to dyes.

The process of making *jumputan batik* is a traditional art that involves careful and in-depth stages. The process of making *Jumputan Batik* can be seen in Figure 2.

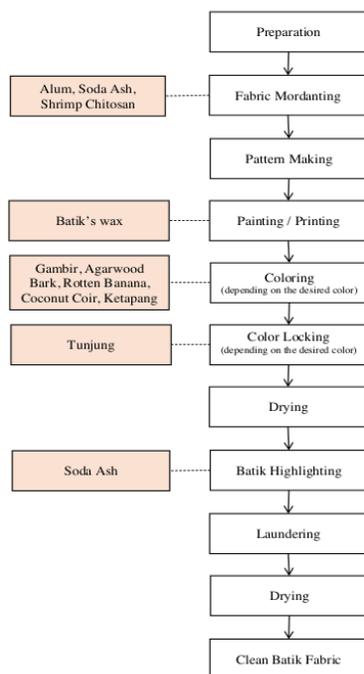


Figure 2. The Process of Making *Jumputan Batik* at Wong Kito Gallery

Figure 2 it has shown that the initial stage of making *jumputan batik* at the Wong Kito Gallery was to prepare mori cloth as the main medium to be painted with distinctive motifs. The next

process was checking using heated batik nights, which were applied using a small pan that has a narrow end to produce small dots or jumpants that depicted batik motifs. After the batik night was applied, the next process was to make motifs using canting, a traditional tool used to write with batik night. Canting consists of copper and bamboo or wood. Copper is used as a candle holder. While bamboo or wood is used as the handle or handle[22] Figure 3 showed the process to make motifs using canting.



Figure 3. The process of making *jumputan batik* at Wong Kito Gallery with Dyeing by utilizing horticultural waste



Figure 4. Processing of making *jumputan batik's* motif with horticultura waste using canting

Canting was used to create intricate and detailed patterns in accordance with the tradition of *Jumputan batik* motifs at Wong Kito Gallery. After the motif was completed, the fabric was then dyed using natural dyes that match the desired design. Staining was done carefully to maintain the brightness of the colors as well as to avoid unwanted color spread. The bonds formed between fibers, mordant and natural dyes play an important role in determining the change in color

intensity in the fabric caused by washing and sunlight [23]. Dyeing was used from horticultural colors such as Shrimp Shell Dregs, Residues from gambier extract, Leaves of Ketapang, Coconut fiber, Peels and leaves of Gaharu, Bananas rotten/ not harvestable.

The final process of making *jumputan batik* was processing to remove batik night by melting and washing it, thus producing a clean batik fabric that was ready to be used or sold.

Natural dye results in an environmentally friendly process [24]. In addition, natural dye has results that are antimicrobial, antifungal, UV protection, and distinctive aroma and do not cause health problems [25]

The final result of *jumputan batik* at Galery Wong Kito have 4 variations of typical Palembang motifs from the type of horticultural waste material for coloring. Figure 5. Showing the motif and color of *jumputan batik* produced by dyeing with Gambir extract, Coconut fiber and Ketapang leaves.



Figure 5. Flowers and *Rumah Limas* motif from Gambier extract, Coconut fiber and Ketapang leaves.

Gambier gave a deep and durable dark brown or reddish color to *jumputan batik* fabric, gambier extract provides an aesthetic effect that reflects the sustainability of the use of natural ingredients in the creative industry. Gambier extract contains key components such as catechins, anhydrous catechins, and pyrocatecotoxins that can give color with the help of mordants. Each method and type of mordant produces different colors and color strengths, ranging from light brown, reddish brown, to dark brown. Mordant  $Al_2(SO_4)_3$  tends to give a lighter color as compared to Mordant  $FeSO_4$  produces a darker color [26] and the post mordant method produced a higher color strength compared to the simultaneous mordant method [27].

Coconut fiber gives it a light brown or soft brown [28] to golden color, and showed the use of eco-friendly local materials in batik production. The optimal conditions for the staining method were found at 80°C with dye

concentrations of 4%, 6%, and 8% for 45 minutes using mordant alum and vinegar [29].

Meanwhile, ketapang leaves give light and natural shades of brownish-yellow or yellowish-green to batik motifs, complementing the natural beauty in the final result of the batik fabric. Figure 6 has shown the motif and color of *jumputan batik* produced by dyeing with Gambier extract and Shrimp Shell Dregs.



Figure 6. Flowers and *Rumah Limas* motif from Gambier extract and Shrimp Shell Dregs

In Figure 6, it has shown that Gambier extract (*Uncaria gambir*) gave a brown color to the batik fabric motif. The dyeing process using natural gambier dye with a concentration of 5% and a weight/volume ratio of 1:30 has been optimized. Staining is carried out at 70°C for 30 minutes. After the dyeing process, the cotton fabric is dried in a shady place to protect mordant that may be very sensitive to light [26]. The meaning of the flower motif symbolizes the beauty of nature, life, and has cultural meaning. While the color produced by shrimp shell pulp varies depending on the extraction method and the type of natural dye obtained, it usually produces purplish red and orange colors. Figure 7 has shown the motif and color of *jumputan batik* produced by dyeing with Ketapang Leaves and Rotten Banana.



Figure 7. Flowers and *Rumah Limas* motif from Ketapang leaves and rotten banana

Figure 7 has shown that the natural dye from Ketapang leaves produces a dark green or brownish-green color depending on the type and condition of the leaves used. the ketapang leaves produce a turmeric yellow color [30], or

brownish yellow to dark brown [31]. The extraction of dyes from Ketapang leaves usually involves a dyeing process or extraction with a certain solvent to obtain a stable and durable color on textile fibers, combined with rotten bananas have a brownish-yellow or light brown color depending on the condition of the fruit and the extraction process used. The best results with the rotten banana bisa diperoleh through the dyeing and the cold biomordant [32]. Figure 8 has shown the motif and color of *jumputan batik* produced by dyeing with rotten banana.



Figure 8. Flowers and *Rumah Limas* motif from rotten banana

Rotten bananas can produce natural coloring substances with colors that may vary from brownish yellow to light brown. [33]. It has shown by figure 8. The dyed banana fiber fabric depends on the batik fabric used, if with blue reactive dye it shows a darker color [34]

The final result of the process of making clean batik with various motifs such as flowers, lilas houses, and other combinations showed evidence of artistic ability. These motifs present natural and unique colors to batik fabrics thanks to the use of natural materials such as gambier, coconut, ketapang, and even rotten bananas. This makes this natural batik different from those that use synthetic dyes.

In addition to utilizing waste from landfills, this initiative not only helps reduce waste, but also improves the welfare of the local community by increasing income by up to about 50% based on production level, equivalent to around 3,850,000 rupiah per month.

#### 4. Conclusion

**4.1.** The Pesona Sriwijaya Group is committed to sustainability by strengthening the community and being an example in CSR programs that are not only socially and environmentally responsible, but also provide concrete benefits for people's daily lives. The synergy and collaboration between five groups (Keramasan Crafter, Bukit Crafter, Aksara Group, Indonesian Disabled Women's Association (HWDI), Hijrah),

all of which are fostered by Wong Kito Gallery MSMEs, was the foundation for cultural preservation and economic empowerment. Through the Palembang CINDO (Clean batik initiative for Indonesia) initiative, which has used batik dyes from horticultural waste and food residues, this program created creative solutions to reduce waste volume and reduced the impact of environmental pollution.

**4.2.** Residues from gambier extract or gambier, has the lowest percentage, which was 8.20% of the total waste used. On the other hand, the highest percentage was found in "Bananas rotten/not harvestable" waste, reaching 24.48%.

**4.3.** Types and Utilization of Horticultural Waste for Dyeing Batik *Jumputan* at MSME Gallery Wong Kito utilizes 4 types of waste, namely Shrimp Shell Dregs, Residues from gambier extract, Leaves of Ketapang, Coconut fiber, Peels and leaves of Agarwood to get a unique motif to preserve ancestral traditions.

#### 5. Suggestion

The need for a waste management strategy by involving the coordination and role of SOEs, the community and academics in collaborating to minimize the disposal of horticultural waste as a useful resource.

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