

Development of the Potential of Telang Flowers for an Empowerment-Based Herbal Market in Sumberlawang District, Sragen, Central Java

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Abstract

Developing a local resource-based potential by encouraging community involvement is the right choice to maintain environmental sustainability while providing optimal benefits for local communities. This community service aims to (1) develop the potency of the butterfly pea (telang) flower as herbal food; (2) increase the economic potential of the telang flower; (3) provide community economic empowerment; and (4) provide student involvement in MBKM. The community service was carried out by applying training and mentoring methods, involving local government partners and the community. Meanwhile, in implementing the method in the field, the community becomes the main actor in designing and analyzing their potential and problems for the purpose of creating innovative products that will provide added value and competitiveness. The result of this service is that the community understands the potential of the butterfly pea flower for example being able to create food and drink by using the flower to increase economic value and have an impact on people's welfare.

Keywords: butterfly pea flower, empowerment, herbs, MBKM

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Introduction

One of the potential tourism destinations in Sragen is the Kedung Ombo Reservoir. Unfortunately, the visitors who come there are visitors with special interests, especially for fishing. Enthusiasm for family-based tourism also needs to be increased so that the economy of the people in the area will also increase. The main tourism development is based on what to see, and the condition of the Kedung Ombo Reservoir is also not very attractive because there are still very few photo spots there, and the climate is too hot that it makes visitors uncomfortable being there. One of the ways used to increase tourism visits without reducing environmental sustainability is to utilize the existing land in two tourism areas as one of the attracting visitors but also providing benefits in the form of increasing food security or increasing innovation from home industries for healthy food and drinks.

In line with the trend of a healthy lifestyle developed in society, public awareness about the importance of consuming healthy food is one of the distinct opportunities for butterfly pea flower cultivation. The flower is a native Indonesian plant originating from Ternate, Maluku, which is one of the plants that grows easily and is an alternative to traditional medicine that is affordable and reduces excessive consumption of chemical products. Butterfly pea flower is a type of vine and the ease with which this plant grows and does not require expensive planting media will provide its own opportunities for the community to easily propagate it. The best butterfly pea flower growth is in full sun so there is no need to worry if the weather conditions are dry or lack of water (Anggriani, 2019).

Butterfly pea ('*bunga telang*' in Indonesian) or *Clitoria ternatea*, is a type of vine usually used as an ornamental plant. According to research by Tmannetje and Jones (1992), butterfly pea flowers can adapt well to sandy soil conditions, are resistant to drought with rainfall of 500-900mm/year, and are able to compete with weeds (disturbing plants). Butterfly pea flower is good enough to be used as a ground cover plant because its development is quite fast and easy. Malabar spinach (a type of '*angkung*' plant in Indonesian) or *Basella alba* has the same characteristics as the *telang* flower, which is easy to grow and resistant to heat.

This blue, white, pink, and purple *telang* flower can be used for food coloring, cakes, and as a basic ingredient for making drinks (Purwandhani et al., 2019). *Telang* flower can be an alternative to synthetic dyes which are often found in drinks sold at schools, such as *mar*, jelly,

ice lolly, *cendol* ice, and *teler* ice. Efforts that can be made to prevent the increasing use of unsafe synthetic dyes are by making natural dyes. Butterfly pea flowers contain tannins, flobatanin, carbohydrates, saponins, triterpenoids, phenolphavanoids, flavanol glycosides, proteins, alkaloids, anthraquinones, anthocyanins, stigmast 4-ene-3,6 diones, volatile oils, and steroids (Budiasih, 2017).

The high antioxidant content is useful for maintaining skin firmness, as well as making skin youthful and bright. In addition, butterfly pea flowers can also be used to reduce fever, eliminate phlegm and eye drops, and treat irritation of the bladder and urinary tract (Parmata et al., 2016). In addition to traditional medicine, the butterfly pea flower plant is also useful for the food processing industry, especially for natural food coloring, which produces a blue color. The natural nature of the butterfly pea flower is that it has no taste, so it can be combined for a variety of dishes and drinks so that the color is more appetizing without destroying the original taste of the food or drink. The large number of foods containing chemicals circulating to attract children to buy, especially for school snacks, makes parents worry about the health condition of their families.

The phytochemicals contained in *telang* flowers have great potential as antioxidants, antibacterials, anti-inflammatory, analgesic, anti-parasitic, and antihistamine. It also improves the immune system and plays a role in the nervous system (Mukherjee et al., 2008). Apart from being a medicine, *telang* flowers are often used as a natural food coloring such as *telang* rice, *telang* pie, *telang* pudding, and even as a drink, namely *telang* tea. However, efforts to cultivate butterfly pea flowers in Indonesia are not yet common, so people need to be made aware of the use of butterfly pea flowers, both in terms of beautifying the landscape as an ornamental plant and in terms of health needs. Figure 1 shows pictures of the butterfly pea plant.

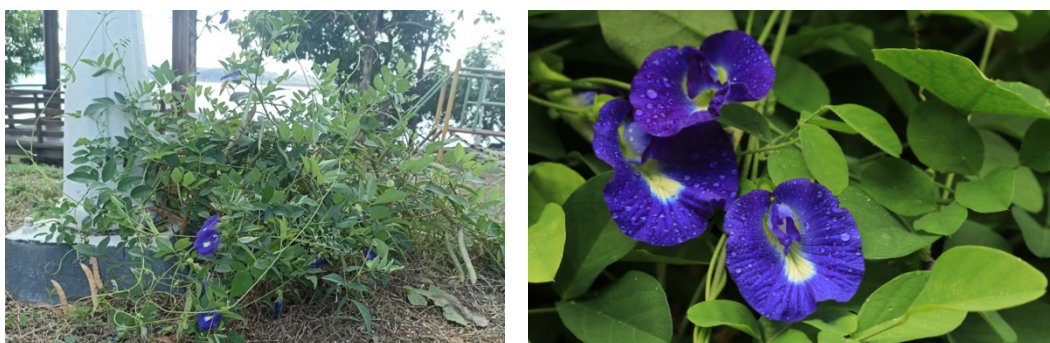


Fig. 1. The butterfly pea plant
Source: Personal photo collection

The use of the butterfly pea plant is still minimal in the community, so it requires a mover from academics, especially lecturers whose students take the *MBKM* scheme (formal higher education programme from Indonesian government) to do community service. The role of the university in synergy with the local government to develop the potential of butterfly pea flower as a healthy and herbal food/drink is complementary to the development of MSMEs in Sragen district based on the tourism, agriculture and fisheries sectors. It is undeniable that herbal markets still have a place in society.

Until now, traditional medicine for diseases using traditional medicine, better known as herbal medicine, continues to be preserved by modern society (Arisandi & Andriani, 2011). The herbal market in Indonesia is only around 20 trillion rupiahs, while the opportunity for the international herbal market reaches 2,000 trillion rupiahs and provides an illustration of the niche market for this local wisdom-based industrial sector that is increasingly wide open, especially in the post-pandemic of Covid-19. The large added value from the herbal market will open up opportunities for greater economic growth, but also the potential for prosperity for actors in small, medium, and cooperative industries.

The purpose of this community service were:

1. To develop the potency of *telang* flower as herbal food.
2. To increase the economic potential of the *telang* flower.
3. To provide community economic empowerment.
4. To provide student involvement in *MBKM*.

Methods

The blue color of the butterfly pea indicates the presence of anthocyanin. Butterfly pea flowers, which have a high antioxidant content, are generally used as an eye remedy, a medicine to get rid of phlegm in chronic bronchitis, reduce fever, and irritate the bladder and urethra (Parmata et al., 2016).

The steps taken in utilizing the butterfly pea flower are:

1. Fresh butterfly pea flowers

Freshly picked butterfly pea flowers can be consumed immediately by adding to water. After being washed clean, the butterfly pea flowers can be directly brewed with hot water and will

bring out a blue color and a fresh aroma. Fresh flowers are usually used to make warm drinks and food coloring. Fresh butterfly pea flowers can be added with lemon grass and ginger, and it will still give a blue color, whereas when added with lime it will change to a very attractive purple color. Utilization of fresh butterfly pea flowers as shown in Figure 2.

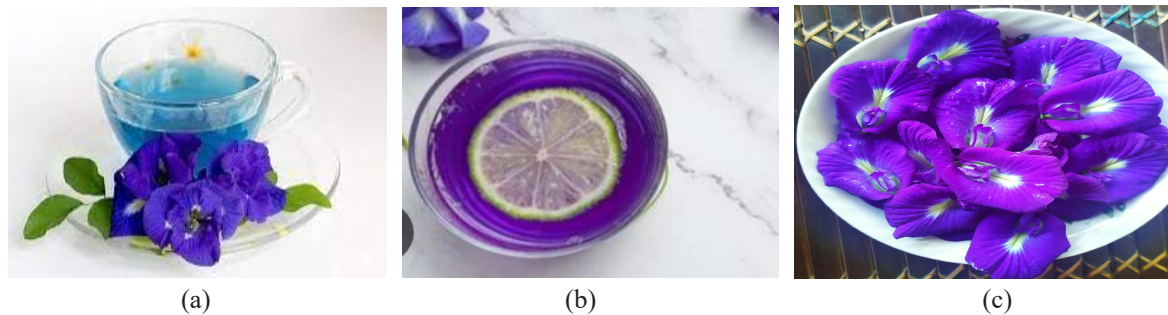


Fig. 2. Various uses of butterfly pea flowers for drinks: (a) butterfly pea drink, (b) butterfly pea flower and lime drink, (c) fresh butterfly pea

2. Dried butterfly pea flowers

When cared for properly, butterfly pea plants will thrive and produce quite a lot of flowers. Flowers that have been picked and not directly used can be used for a long time if they have been dried. Therefore, one of the best ways to preserve butterfly pea flowers is to dry them in the sun. The process of drying the butterfly pea flowers is by lining up the butterfly pea flowers without overlapping them so that the flowers can dry optimally and do not leave water which is prone to mold. The butterfly pea flower should not be dried in the hot sun because it will remove some of the substances contained in the butterfly pea flower. The butterfly pea flowers should be dried between 8 and 11 am in the morning while airing them. Before being dried, the butterfly pea flowers must be washed clean first so that after they are dry and clean they can be stored immediately in a closed container and placed at room temperature. Avoid placing the butterfly pea in the refrigerator, as this will cause mold to form. The dried butterfly pea flowers can be stored and used for up to 2 months.

The dried butterfly pea flowers can be used immediately by boiling them in water until they boil. Below is a picture of a dried butterfly pea flower (Figure 3).



Fig. 3. Dried butterfly pea flowers

3. Production of dried butterfly pea flowers

Dried butterfly pea flowers can last up to 2 months so they can be marketed both online and in person. Currently, many home industries sell butterfly pea flowers online through marketplaces at competitive prices. Per 100 grams of dried butterfly pea flowers can be marketed between IDR 15,000 to IDR. 29,000, - depending on the method of packaging and also the completeness of the marketing. Some examples of butterfly pea that have entered the online and offline markets are shown in Figure 4.



Fig. 4. Dried butterfly pea flowers ready for sale

4. Recipe for culinary butterfly pea flowers

There are several recipes for butterfly pea flowers that can be sold directly to food stalls/culinary businesses, including the following:

a. Ginger *telang* drink

Some of the ingredients used to make butterfly pea tea are as follows:

- 5-7 strands of butterfly pea
- 400 ml of water
- 3 cm ginger

How to make *telang* flower ginger tea is as follows:

- Put the water in a pot and boil until it boils, then add the peeled and crushed ginger into the cooking water.
- Wait for the ginger aroma to come out, and when it comes out, add the butterfly pea flowers. So that the blue color comes out, it needs to be stirred occasionally.
- Remove and strain and serve in a glass or cup. Can also add honey.

Telang flower ginger tea drink has several benefits, as follows:

- Can control blood sugar, the content in the butterfly pea flower helps the absorption of sugar in the blood, causing glucose to be more controllable.
- Lowers blood pressure.
- Against cancer, because the content in the butterfly pea flower can fight the malignant cells of the cancer.
- Smooth digestion, the antioxidants contained in the butterfly pea flower will make the stomach muscles more relaxed so as to make digestion smoother. The anthelmintic content is also present in the butterfly pea flower which functions to prevent the growth of worms in the intestines so as to make digestion healthier.
- Prevent nausea and vomiting

b. Butterfly pea syrup

Besides being able to be processed into tea, butterfly pea flowers can also be processed into syrup.



Fig. 5. Butterfly pea syrup

The ingredients needed to make the syrup are:

- 500 grams of sugar
- 500 ml of water

- As needed, the butterfly pea flowers that have been washed clean, the more you want a deep blue color, the more butterfly pea flowers you need.
- 2 pieces of lime leaves
- Lemongrass

How to make it is as follows:

- Put the sugar and water into a saucepan, then stir well and turn on the stove. Bring the solution to a boil, and keep stirring so that the sugar dissolves completely.
- If it's boiling, then add the butterfly pea flower, lemongrass and lime leaves. Cook again using medium heat and stir so that the water turns blue as desired.
- When it is cooked, turn off the stove and wait until it cools down.
- After it's cold, put it in a glass bottle and put it in the fridge/refrigerator to make it last longer.

c. Blue butterfly pea flower rice

For housewives who want to develop their business by making innovations, butterfly pea flowers can be one of the raw materials, especially for culinary-based businesses. One of the innovations that can be made with butterfly pea flowers is the culinary eggplant rice, which has a blue color that makes it appetizing.



Fig. 6. Blue butterfly pea flower rice

Materials to be provided:

- 3 pieces of dried butterfly pea flowers
- 500 grams of rice
- 400 - 500 ml of thin coconut milk
- 1 pandan leaf

- 2 bay leaves
- 1/2 teaspoon salt

How to make blue butterfly rice:

- Rice is washed clean and soaked briefly. Then drained to dry.
- The dilute coconut milk is boiled together with the butterfly pea flowers, and after the dark blue color comes out, it is then filtered.
- Cook rice, add pandan leaves, salam, and salt in a rice cooker.
- Then instead of water, add the blue coconut milk and stir well.
- Cook rice until cooked and serve according to taste.

The community service with the main theme of utilizing butterfly pea flowers was carried out by inviting students to *MBKM* activities, especially in empowering the community. The involvement of students causes community service to run well and smoothly and also intense assistance causes creative ideas to emerge from the community directly.

Results and Discussions

The community service was carried out in the village of Ngargosari, Sumberlawang, Sragen, using participatory training methods. The target of this training was housewives who do not yet have jobs and productive businesses, as well as those who already have businesses (especially in the culinary field) but have not developed the business properly. The method of implementing the community service was adapted to the problems faced by partners and the solutions offered, which require synergy from experts to provide information dissemination, direction, and examples to the subject of service. The problems and solutions offered in this service in detail are as follows:

1. The first problem encountered at the Kedung Ombo reservoir was the number of visitors who had decreased and the few visitors during the day and certain seasons because the climate was relatively hot so it does not provide comfort to visitors. The proposed solution was to increase the number of shade plants on the pergolas to increase the number of visits because the location was getting cooler and there were places that could be used as photo spots. The implementation method was to plant cassava plants on pergolas that had been prepared in both places by involving students who take *MBKM* to practice in agricultural/agricultural economics courses.

2. The second problem was the decrease in income turnover from MSMEs in Kemukus tourism and the Kedungombo Reservoir because the food and beverage products offered were monotonous and there was no added value which could cause visitors to become interested in enjoying them. The solution offered was to provide more value to the food and drinks offered but not increase the costs and hence the prices. The implementation step taken was to carry out training by inviting experts to increase the variety of products being sold, one of which was health and herbal food and drink utilizing butterfly pea flowers.
3. The third problem was how to increase economic potential by empowering housewives, both those who have their own businesses and those who do not have businesses, with online-based marketing. The solution offered was to make home industry products made from butterfly pea flowers which could be sold on an online marketing platform so that they would increase in economic value.

The next step was to provide assistance which requires the role of academics, both lecturers and students. The target of this service was that the community at the service location knows the uses of these two plants as a support for the herbal market and could be used to increase income because of community empowerment to not only become distributors or sellers in the tourism ecosystem in Sragen but also become producers. If the community wants to develop its business by also performing plantation and production, the local education-based tourism will develop so that tourism development would advance to the next stage on a what-to-do basis. This concept does not only develop tourism based on what is seen but what is done. Visitors can come to enjoy the natural scenery on Mount Kemukus and the Kedung Ombo Reservoir, then proceed to practice making tea or butterfly pea flower syrup. The community service process in Ngargosari Kedung Ombo village is shown in Figure 7.

The telang plant has been widely used in the food sector, especially as a natural coloring ingredients. Many people use it to add color to cakes such as purple milk pie, rolled pancakes, klepon cakes, and others, even in Malaysia, this plant is used to color sticky rice known as Nasi Kerabu. In Thailand, butterfly pea flowers are used as a natural coloring in syrup (Wahyuni et al., 2019).

According to Marpaung (2020), the butterfly pea flower is an ingredient for functional foods and nutraceuticals. The potential of the butterfly pea flower is supported also by several advantages of good butterfly pea flowers which include aspects of cultivation, extract stability,

and sensory qualities. The telang flower or butterfly pea flower (*Clitoria ternatea*) is a type of climbing plant that is easy to grow in the yard of the house. Plants that originate from the South American region, it is widely used as a natural dye for food and drinks (Anto, 2021). Butterfly pea flowers can be used as ingredients to increase body immunity. Metliza et al (2021) stated that anthocyanin flavonoid compounds and phenolic compounds in butterfly pea flowers have properties of antioxidant and anti-inflammatory so they can increase the body's immunity.



Fig. 7. Community service process

The telang flower contains anthocyanin pigments and flavonoids which can provide many health benefits such as antioxidants, anticancer and anti-inflammatory. According to Budiasih (2017), telang flowers contain tannins, flobatin, carbohydrates, saponins, triterpenoids, polyphenols, flavanol glycosides, proteins, alkaloids, anthraquinones, anthocyanins, 4-ene-3,6 dione stigmast, volatile oils and steroids. Butterfly pea flowers have a lot of pharmacological potential, including as antioxidants, antibacterials, antiparasitic and antacidal, antidiabetic and anti-cancer.

Conclusion

After carrying out community service and conducting discussions, it can be concluded that the community gained knowledge about the potential of butterfly pea flowers which was previously unknown and utilized. Community have the initiative to increase their potential through empowerment by them and for them. The target community, especially housewives, was developing business ideas by utilizing butterfly pea flowers as an effort to improve the household economy which would ultimately improve the community welfare. It is also expected that this activity can increase participants' knowledge and insight regarding the butterfly pea flower plant and can also provide inspiration to maximize the use of the butterfly pea flower plant. Apart from being beneficial for health, *telang* tea can also be used as a commercial product which can be a source of additional income for the community.

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