

GREEN INTERCONNECTION - INTEGRATION: FICUS FOR WATER AND LIFE ALONG THE OPAK RIVER BANKS IN RANDUGUNTING VILLAGE, KALASAN, SLEMAN, YOGYAKARTA SPECIAL REGION

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Abstract - *Ficus plants hold significant potential for sustaining life, thanks to their robust root systems, abundant water resources, and crucial role in supporting human and animal ecosystems. Recognizing the importance of educating the community about various aspects of ficus plants, a community engagement initiative was launched in Randugunting village, situated within the Opak River Banks. The project aimed to raise awareness and knowledge among the residents of Randugunting, specifically focusing on the environmental and economic benefits of ficus plants. The project employed diverse approaches, including educational activities for children in Randugunting through a combination of Quranic Education Garden programs and environmental awareness sessions. Additionally, workshops were conducted to showcase the nutritional and economic potential of ficus plants, such as using *Ficus racemosa* for nutritious dishes and producing economically valuable and health-conscious tea from *Ficus septica*. These workshops targeted youth and members of the Family Welfare Movement in Randugunting. Furthermore, an online campaign was launched through a dedicated Facebook group named "Masyarakat Ficus" (Ficus Community) and a website containing articles related to these activities. Additionally, ficus plant seedlings were cultivated with the intention of distributing them within Randugunting to support reforestation efforts along the Opak River. This community engagement effort results in an increased understanding of ficus plants among the local population and a growing interest in developing healthy and economically viable products from these plants. This initiative serves as a model for promoting sustainable practices and enhancing the overall well-being of communities in riverbank areas.*

Keywords: *Ficus, Ficus Racemosa, Ficus Septica, Educational Activity, Environmental Awareness*

1. INTRODUCTION

Water is one of the most crucial blessings in human life. Islamic teachings emphasize the responsible use and preservation of water to ensure the sustainability of this vital resource for future generations. The significance of water is beautifully expressed in the Quran, Surah Al-Anbiya (21:30), which states: "And We made from water every living thing. Then will they not believe?" This verse underscores the essential role of water in all living creatures and invites reflection on its importance. Indonesia, an archipelagic country located in the tropical region, is blessed with abundant water resources due to its natural design. However, studies by various organizations have indicated that Indonesia is facing a water crisis, with 18 out of its 278 million population experiencing a shortage of clean water sources. Poor sanitation issues have also led to contamination affecting 70% of household water in Indonesia. Ironically, 60% of Indonesia's population resides on the island of Java, which has only 10% of the country's total water supply. According to a study, by 2040, the per capita water supply is projected to be only 476 m³, well below the ideal requirement of 1600 m³ per person. This highlights a serious shortage of clean water in Java, largely caused by human activities, including massive deforestation.

Indonesia is renowned for its incredibly high biodiversity, ranking second in the world after Brazil. This biodiversity is due to Indonesia's equatorial location, making it a tropical paradise. Among the diverse flora, the Genus *Ficus*, known as the fig tree or 'beringin' in Indonesia, thrives. Indonesia has approximately 365 species of *Ficus* within the Malesian region, with 252 of them found within its borders. The distribution of *Ficus* species is almost uniform, with a strong presence on major islands like Kalimantan, Sumatra, Papua, Sulawesi, and Java. *Ficus* plays a crucial role in forest ecosystems and is a key species in tropical regions due to its year-round fruiting ability. *Ficus* comes in various growth forms, including trees, shrubs, small trees, lianas, climbers, hanging figs, and even epiphytic figs. Plants in the Moraceae family, to which *Ficus* belongs, are characterized by their abundant latex content in the stem, branches, and leaves. *Ficus* also has a unique inflorescence called a syconium, a fleshy and hollow structure in which flowers and seeds develop (Yusuf, 2011).

In Indonesian society, the *Ficus* tree or 'beringin' is often viewed with awe due to its large and impressive structure, surrounded by many myths and superstitions. However, beyond these superstitions, *Ficus* trees provide numerous benefits to both humans and the environment. They contribute to water management and natural slope stabilization through their extensive root systems, effectively binding the soil. Additionally, their dense canopies enable efficient CO₂ absorption and oxygen production. The thick canopy also serves as a habitat for various wildlife, including birds and insects. Given the importance and potential of *Ficus*, public awareness and conservation efforts regarding the significance of *Ficus* in Indonesia are needed. In this context, we aim to initiate the introduction and preservation of *Ficus* in Randugunting Village, Tamanmartani, Kalasan, Sleman, Special Region of Yogyakarta, located along the Opak River. These efforts will

encompass several programs, including Ficus transplantation and propagation, community involvement during Ramadan, workshops on food and Ficus-based economics, creative content creation related to Ficus, and more. Through these initiatives, we hope to promote the conservation of Ficus and expand the knowledge of the residents of Randugunting Village and the general public regarding Ficus species, their benefits, and their potential contributions to society and the environment.

2. METHOD

The Community Service/Engagement implementation method comprises education, counseling/workshops, relocation, and planting, as well as disseminating information on social media. Partners for this activity include the community, consisting of Al-Huda mosque youths and community figures such as the head of Randugunting hamlet and the head of the Family Welfare Empowerment organization.

2.1. Educational Activities Method

The educational program on Ficus plants was conducted over a span of 10 days with a well-structured approach. The program involved teaching Quranic studies and introducing Ficus-related content to approximately 100 children daily at a local TPA (Taman Pendidikan Al-Quran). To ensure efficiency, responsibilities were divided among 4-6 team members each day. The program commenced with self-introductions and an overview of the educational activities. Throughout the days, Quranic studies were integrated with Ficus information, including interactive elements like educational stickers. An educational video presentation and subsequent comprehension quizzes were conducted to engage the children. The hands-on experience was provided as the children learned the art of grafting Ficus branches, with close supervision to ensure safety. The program concluded with a coloring competition for younger children and continued Quranic studies for older ones. The method incorporated a mix of teaching strategies and interactive activities to make the learning experience engaging and comprehensive, ultimately fostering both Quranic knowledge and an understanding of Ficus plants.

2.2. Method for a Workshop on Ficus-Based Food and Economy

The workshop aimed to enhance community knowledge and creativity in utilizing Ficus plants to improve food security and economic well-being. It consisted of two sessions: the first focused on food security, while the second explored Ficus-based ecoprinting and other potential plants. Planning commenced with task assignments, content preparation, and logistical arrangements, including obtaining permissions and spreading awareness among local participants, primarily members of the Family Welfare Empowerment and mosque youth. The food security session involved gathering relevant materials, creating presentations, and crafting sample products such as Ficus leaf rolls and Ficus tea. The ecoprinting workshop, on the other hand, covered gathering materials, introduction to Ficus, its entrepreneurial

potential, ecoprinting techniques, and hands-on practice in making plant-patterned fabric items. The workshops took place in the village hall with 35 participants, and the program commenced with opening remarks from the PKK leader and village youth head. These workshops not only disseminated practical knowledge but also inspired participants to explore Ficus-based enterprises, contributing to community food security and economic resilience.

2.3. Method for Relocation and Planting Activity of 1000 Ficus and Ficus Gallery

The establishment of the Ficus Gallery at UIN Sunan Kalijaga serves a dual purpose, namely, creating a cool and green campus environment while raising awareness of the ecological importance of Ficus trees within the university community. This initiative involved meticulous planning and collaboration with the team responsible for procuring 1000 Ficus saplings. The chosen gallery location, agreed upon through coordination, is the rear courtyard of UIN Sunan Kalijaga's Integrated Laboratory. The process included the preparation of planting media, such as soil and rice husks, along with the procurement of essential tools like hoes, shovels, and brooms. Subsequently, Ficus saplings sourced from the 1000-sapling acquisition program were prepared for planting. The site preparation involved clearing the courtyard of debris and overgrown weeds, which had previously been treated with herbicides to facilitate removal. Next, the soil was mixed with rice husks to prepare the planting medium. A total of 12 holes, approximately 30 cm in diameter, were dug in three rows with approximately 1 meter spacing between holes. The Ficus saplings were then transplanted from their polybags into the prepared holes, along with the planting medium. Finally, each Ficus species was identified and labeled with its Latin name, and a watering and maintenance schedule was established to ensure the healthy growth and sustainability of the Ficus saplings in the Ficus Gallery.

2.4. Method for Spreading Information on Social Media (Posting on Facebook and Website)

The social media contribution program involves posting articles on a website and sharing photos on Facebook related to Community Service Program activities and Ficus plant information. The aim is to disseminate knowledge about Ficus plants and their benefits. The execution phase includes the mandatory participation of all members in Ficus-related Facebook groups, such as the "Masyarakat Ficus," to share their activities and engage in discussions with members from various regions. Scheduled content uploads following established themes facilitate discussions and communication within the "Masyarakat Ficus" group. Additionally, each member is required to create articles on Ficus, aligning with predetermined themes or choosing their own as long as it remains within the Ficus context. Furthermore, a website (www.sukaficus.site) serves as a platform for uploading these articles, promoting environmental advocacy accessible to the younger generation through the internet.

3. RESULTS AND DISCUSSION

3.1. Educational Activities

Based on UU SISDIKNAS no.20 year 2003, education is a conscious and planned effort to realize an atmosphere of learning and learning in order to actively develop its potential for spiritual power, self-restraint, personality, intelligence, nobly, and community skills. Education comes from the word 'educate' which has the sense of process or means or the means of educating. In language, the definition of education is the process of changing the attitudes and manners of a person or persons in an effort to enlarge mankind through teaching and training efforts.

Indonesia is known for its natural wealth, one of which is the existence of the Ficus tree. The Ficus is an essential part of a vital ecological ecosystem. But, unfortunately, in this digital age, many children grow up without knowing the beauty of the world around them. Given the importance of the ward education for the younger generation, then the environmental introduction and learning activities mainly Ficus plants need to be done. The education about Ficus serves to promote Ficus tree and makes the children aware of the importance role the Ficus tree can play in the surroundings. Education activities are carried out in three separate key activities of watching animation videos, transplanting Ficus, and coloring pictures of Ficus.

Ficus plant education was carried out in the TPA of the Al-Huda mosque for 10 days on March 2 to April 1, 2023. At this activity, our group cooperates with the mosque's al-huda youth to helped them teach khibar and Al-Quran to children and also arranged activities to introduce ficus to the children. On the first day, we introduced ourselves to the children and gave little introduction to the educational activities we would do as the opening. On the second and third days, we only taught khibar and the Al-Quran and inserted a little material about Ficus. On the fourth day, we invited the TPA children to watch animated videos on the projector about plants and ficus. The content of the video presented encourages children to pay more attention to the natural world and also to tend to plants including Ficus. After watching the video, it is hoped that children can come to know the plants of the Ficus and realize how beautiful the natural environment is all around us.



Figure 1. Educational activity

On the fifth and sixth days, we taught khobar as usual and introduced a little ficus material. On the seventh day, we taught the children how to transplant a ficus twig. This study is intended to give children an experience in one of the techniques to increase plants in addition to planting seeds. With the practice of transplant, it is hoped that children will be able to transplant and plant mainly ficus trees independently. On the eighth and ninth days, we teach khobar again. On the tenth day, we held a colored ficus plant drawing contest. There are 3 winners who will get the prize. The coloring contest aims to train student's creativity while introducing Ficus plants.



Figure 2. Educational activity (2)

All the activities that have been carried out have served the same purpose of disseminating information and insights into the Ficus plant and its benefits. This education is important to be done especially since children are the future generations that will lead the nation. It is necessary, therefore, to instill a love for plants in children so that the natural environment will be preserved in the future.

3.2. Relocation and Planting Activity of 1000 Ficus

Ficus is one of the most important types of plants in the forest ecosystem. Some living organisms depend on the existence of Ficus such as insects whose characteristics are specific. In general, people know Ficus by the names Beringin, ara/aro, jilanuak or sikalabuak with special features on the shape and structure of the fruit called fig or syconium. Ficus consists of almost 800 species which are spread throughout the world but are found more often in tropical areas mostly in indo-malaysia. Ficus can be found in forests in the highlands to lowlands or open areas (Nur'aini *et al.*, 2013).

In this 1000 ficus seedlings activity, we have carried out several stages of implementation starting with trying to find ficus seeds that grow naturally in several forests. The members also tried to find these ficus seedlings in their respective areas. After finding and collecting the ficus seedlings, we conditioned them so that they could be replanted, and revived these ficus seedlings. In this planting we use several tools such as polybags, which are used to sow ficus plants and can also

facilitate their maintenance. In this 1000 seedlings activity, there are many challenges from seedlings that cannot live perfectly, or seedlings that fail to grow. But we try and find solutions so that the seeds we plant can live and can be disseminated in areas that are in need or crisis of living plants.



Figure 1. 1000 Bibit Ficus activities

The 1000 bibit ficus activity supports efforts to protect nature in the movement to preserve plants and increase greening of nature. The 1000 bibit Ficus activity collaborates with the Ficus Gallery activity in reforestation activities because the two activities are interrelated. It is hoped that this activity can increase knowledge about greening and its impact on nature as well as preserving nature by caring for and cultivating plants, especially ficus.

3.3. Workshop on Ficus-Based Food and Economy

Food security is a crucial issue in the current era, especially considering the challenges faced by climate change and rapid population growth. In the midst of this dynamic, it is important to explore natural resources that have not been fully utilized to meet human food needs. One plant that is promising in this context is the Ficus Plant. This plant, which is often referred to as the fig plant or ara-araan, has a number of species that have delicious, edible fruit. Ficus plants have many potential health and nutritional benefits. The Ficus plant is an interesting example of a natural resource that can be utilized holistically. In addition to the delicious fruit, the leaves, roots, and even latex of some Ficus species can provide a distinctive taste and various health benefits. One part is ficus leaves. Leaves are an often overlooked part of the plant, but in some types of Ficus plants, the leaves are not only safe to consume but are also delicious and rich in health benefits. However, keep in mind that not all Ficus species have leaves that are safe for consumption.

This food security workshop activity consisted of 2 topics related to the use of ficus leaves. The first topic is the use of ficus leaves as roulades and tea. In making this roulade, we used ficus loa leaves. Ficus loa or its original name is ficus racemosa. Few people consume it and 88% of people do not consume Ficus racemosa. Some residents think they are afraid to consume the fruit because it tastes bitter and they are afraid of poisoning. There is a lot of research on parts of Ficus racemosa such as

fruit, roots and leaves which are used as medicine (Zaharah *et al.*, 2017). The leaves are used to treat wounds, boils, dysentery and diarrhea (Rasyid *et al.*, 2017). Meanwhile, for tea, use awar-awar ficus leaves. This type of ficus leaf is usually used by people as a wound medicine. Apart from being used as a wound medicine, this plant also functions as a medicine for inflammation. Because the chemical content of awar-awar leaves has the effect of being a medicine used in healing wounds, namely steroids, flavonoids and saponins (Rahman *et al.*, 2013).



Figure 2. Rolade and Ficus Tea

Apart from being a plant that can be used optimally as food, Ficus can also be used as one of the main ingredients in making ecoprints. Indonesia is a country with abundant natural resources. This provides an opportunity to be processed, one of which is processing in the textile industry by utilizing surrounding plants, especially ficus as a natural dye in ecoprinting techniques. The ecoprint technique is a technique for forming motifs on fabric by transferring color and shape from objects, in this case the objects are plants, both leaves and other body organs (Tresnarupi & Hendrawan, 2019).

The Ficus-based economic resilience workshop is a workshop created to provide a kind of training to participants about ecoprinting techniques, so that participants can use this technique as a business idea. In this workshop there is a joint practice of making handkerchiefs with plant motifs. The ecoprinting technique used in practice is the dry ecoprint technique, namely by hitting the plant part under the fabric until the color appears and soaks into the fabric, then fixing the motif using alum water.

The material discussed in the ecoprinting workshop was a brief introduction to Ficus trees, the potential of Ficus as a business idea, an explanation of ecoprinting techniques, and procedures for making ecoprinting. In ecoprinting parakeets, all participants made handkerchiefs with different motifs. The handkerchief can then be taken home to be used at the workshop participants' homes.



Figure 5. The result of ecoprinting

3.4. Ficus Gallery

Ficus trees, known as fig trees, are a type of plant that has high ecological and aesthetic value. Its existence is able to provide benefits in maintaining ecosystem balance, providing shelter for various types of fauna, and providing fresher air through the process of photosynthesis. The aim of creating the Suka Ficus Gallery is to create a cool and beautiful environment. Apart from that, identifying each type of Ficus tree was also carried out to introduce Ficus species to gallery visitors.

The first step in making a Ficus gallery is preparing tools and materials. After the tools and materials are ready, the location for making the gallery is also prepared and spraying uses medicine at the location to be used. The next activity is mixing the soil with husks and making 12 holes with a diameter of ± 30 cm, which are made into 3 rows and given a space of around 1 m for each hole. The next stage is to transfer the Ficus seeds to a large polybag and then fill the polybag using planting media. After that, Ficus seeds are put into each dug hole along with polybags and planting media. The final stage is identifying the species of Ficus plant, then attaching the Latin name of the species to the Ficus stem. The types of Ficus trees planted in the gallery include awar-awar, loa, benamina, alpipila, black emery, and white emery, as well as many other types of Ficus. Ficus seedling care is carried out carefully so that the Ficus tree seedlings can grow large and bring many benefits to the surrounding area.



Figure 6. Ficus Gallery

3.5. Social Media Campaign

The implementation of the social media contribution program, which revolves around the dissemination of knowledge about Ficus plants and their environmental benefits, has yielded notable results and fostered meaningful discussions within the online community. This initiative, centered on posting articles on the website (www.sukaficus.site) and sharing photos on Facebook, has effectively engaged members and enriched their understanding of Ficus plants and community service. First and foremost, the mandatory participation of all members in Ficus-related Facebook groups, particularly the "Masyarakat Ficus" group, has significantly expanded our outreach. By actively sharing our Community Service Program activities and engaging in discussions, we've been able to connect with individuals from various regions who share a passion for Ficus plants. This engagement has not only promoted the dissemination of knowledge but has also encouraged the exchange of experiences and best practices in Ficus cultivation and environmental conservation.

Scheduled content uploads following established themes have played a pivotal role in maintaining a consistent and organized online presence. This approach has ensured that our posts remain relevant and aligned with the interests of our target audience. As a result, discussions within the "Masyarakat Ficus" group have been vibrant, covering a wide range of topics, from Ficus care tips to the role of Ficus plants in sustainable ecosystems. Furthermore, the requirement for each member to create articles on Ficus, whether aligned with predetermined themes or their chosen topics within the Ficus context, has spurred a diverse range of content creation. This diversity has enriched our online platform and catered to a broader spectrum of interests among our followers. Members have showcased their expertise, sharing insights on the cultural significance of Ficus in different regions, its ecological contributions, and innovative cultivation techniques. This approach has not only expanded our knowledge base but has also empowered members to take ownership of their roles as advocates for Ficus plants. The dedicated website, www.sukaficus.site, has proven to be a valuable resource for both our members and the wider audience interested in environmental advocacy. It has served as a centralized platform for uploading and archiving articles, ensuring that our educational content remains accessible and organized. Through the website, we have effectively reached out to the younger generation, fostering a sense of environmental responsibility and appreciation for Ficus plants through the power of the internet.

In conclusion, the social media contribution program has achieved its aim of disseminating knowledge about Ficus plants and their benefits. It has created a vibrant and engaged online community dedicated to promoting environmental advocacy and the cultivation of Ficus plants. The combination of Facebook engagement, scheduled content uploads, member-generated articles, and the

dedicated website has provided a comprehensive and sustainable approach to spreading information and fostering discussions. This initiative continues to thrive, inspiring a new generation of environmental stewards with a passion for Ficus plants and the ecosystems they support.

4. CONCLUSION

This Community Service activity was carried out for approximately 4 months starting from March 22 to June 22, 2023. The work program that we had prepared also ran smoothly and received a good response from the community, although there were several work programs that were not implemented due to several obstacles matter. In the 1000 ficus seedlings activity, there were challenges faced ranging from seeds that could not survive perfectly or seeds that failed to grow. However, the 1000 ficus seedlings activity supports efforts to protect nature in the movement to preserve plants and increase natural greening. Then the food security workshop activity had two outputs related to the use of ficus leaves, namely roulades and tea.

Apart from that, the ficus love gallery program also ran smoothly, starting from preparation to identifying the species of ficus plant on each ficus stem by hanging the Latin name of the species on the ficus stem. The final program is social media contribution, this activity has achieved its goal of spreading knowledge about the ficus plant and its benefits. Of all the programs that have been running, it is hoped that they will provide benefits for everyone and for Randugunting Hamlet in particular.

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