



Community Empowerment through Processing Bamboo Leaves Waste into Liquid Smoke

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ABSTRACT

This Community Service activity aims to process dry bamboo leaves into liquid smoke using pyrolysis techniques. Methods of activity in the form of counseling, training, and mentoring. Participants in the activity were 30 residents of Mejono Village. The resulting product is grade 3 liquid smoke. The effectiveness of the activity is measured using the Pre-test and Post-Test values. The results show an increase in knowledge, production skills, and marketing skills for liquid smoke products. This activity can be an inspiration, motivation, and ongoing activity for the tourism management team to process dried bamboo leaf waste into liquid smoke products that can provide added value for the Gronjongwariti water tourism manager and farmers in Mejono Village.

INTRODUCTION

Mejono Village, Plemahan District, Kediri Regency has a water tourism destination that is in great demand by the community as a tourist destination. Planting bamboo trees in the vicinity of tourist sites produces waste of dry bamboo leaves which continues to grow every day. Bamboo leaf waste that continues to grow can disrupt the environment from the aspect of comfort, cleanliness, and environmental beauty. Efforts made by the manager of the Gronjongwariti water tourism spot are always cleaning bamboo leaf waste every morning and evening. So far, the handling of bamboo leaf waste is by burning it in trash cans. This activity can disturb the comfort of local residents and cause air pollution in the surrounding environment. The lack of knowledge of the tourism management team regarding the processing of dry bamboo leaf waste is the problem with the ineffectiveness of waste management at this location. Bamboo leaf waste can be used as an ingredient in liquid smoke or organic pesticides.

This product is needed by plants to maintain resistance to pest attacks. Liquid smoke is an organic chemical substance produced from the distillation process of smoke through direct or indirect combustion (pyrolysis) using materials containing hemicellulose, cellulose, lignine, and hydrocarbon compounds (Ernawati & Estiasih, 2012; Kondo et al., 2017). Liquid smoke is the result of condensation or condensation originating from steam resulting from the combustion of materials containing carbon compounds, lignin, cellulose, hemicellulose. The acidic compounds from liquid smoke can inhibit spore formation and microbial growth as well as phenolic compounds from liquid smoke which have anti-bacterial properties which show effective antimicrobial activity in vitro against various organisms such as bacteria (gram positive and gram negative), yeast and mold (Suryani et al. , 2020).

The use of bamboo leaves as an ingredient for making liquid smoke is an innovation initiated by the Kadiri Islamic University (UNISKA) Kediri Community Service team in collaboration with the Gronjongwariti water tourism manager. This community service activity aims to assist the management team of tourist attractions in processing dry bamboo leaves into liquid smoke. This activity also aims to empower the people in Mejono village in increasing knowledge about liquid smoke, increasing liquid smoke production skills, and increasing the ability to market liquid smoke products to farmers around tourist sites. Empowerment is an activity that is systematically organized and has the aim of increasing personal, interpersonal or political power, capacity or ability that enables individuals, families or communities to take action to improve situations and conditions that may affect people's lives.

Empowerment activities for the community in Mejono Village are expected to provide positive motivation and inspiration in improving the quality of life, creating independence, increasing human resource knowledge and skills, and encouraging sustainability in economic, social, environmental and cultural aspects. The application of community empowerment can provide strength for the community as a way to respond and take appropriate actions for their sustainable survival (Moh. Yusuf Efendi, 2021). The target of this

Community Service activity is the implementation of a community empowerment program in Mejono Village, Plemahan District, Kediri Regency through Processing Bamboo Leaf Waste into Liquid Smoke.

IMPLEMENTATIONS AND METHODS

Community Service activity methods are: counseling, training, and mentoring. Counseling activities aim to increase the knowledge of participants. Material delivery activities were provided by resource persons from P4S Agro Bio Lestari and the PKM Uniska Kediri team. The series of material presented included: an introduction to liquid smoke, the benefits of liquid smoke for humans and plants, tools and processes for making liquid smoke, types of materials for making liquid smoke, techniques for processing bamboo leaves into liquid smoke, liquid smoke packaging techniques, smoke marketing techniques liquid. Extension activities are complemented by discussion and question and answer activities with participants to deepen understanding of the material. Training activities are carried out by demonstrating how to make liquid smoke using pyrolysis techniques.

This activity aims to improve the skills of participants in processing bamboo leaf waste into liquid smoke. Each participant was involved in the liquid smoke production practice activities directly in order to get real experience and the process of processing bamboo leaves into liquid smoke. Mentoring activities are the efforts of the Uniska PKM team to ensure long-term sustainability of activities. This liquid smoke product is expected to provide added value and become a product of the innovation of the tourism management team that can be marketed to farmers in Mejono Village and the wider community. Through marketing assistance activities for liquid fertilizer products, it is hoped that a competent marketing team will be formed in carrying out promotion, sales and packaging strategies for the resulting liquid smoke products. The steps for community service activities are as follows:

1) Activity Planning

At this stage the PKM team is planning PKM activities to be carried out at the location of the Gronjongwariti water tourism spot. The PKM team holds internal meetings to develop a schedule for implementing activities and assigning tasks to team members.

2) Coordinating with Partners and Surveying the Location of PKM Activities

The PKM team visited partner locations, namely the manager of the Gronjongwariti water tourism spot. The PKM team visited several times to communicate and coordinate with partner teams. The activities carried out include: preparing the workforce to be involved in the management of bamboo leaf waste so that it can be liquid as quickly as possible, determining the location of the activity, both the location of counseling and the location of practical activities, determining the location of the farm to be used as a means of testing liquid smoke, coordinating the time of the activity PKM with partners.

3) Coordinating with P4S Agro Bio Lestari Resource Persons

The resource persons included in the PKM activities were P4S (Self-Help Agriculture and Rural Training Center) Agro Bio Lestari. The resource person will work closely with the PKM team in carrying out counseling and training activities on processing bamboo leaf waste to become liquid as quickly as possible.

4) Preparation for PKM Activities

Preparation for PKM activities is carried out in collaboration between the PKM team and partners. The PKM team formed a committee composition and carried out the division of tasks for each personnel. Activities carried out at this stage include: designing banners, distributing invitations, preparing training materials and activities, preparing materials and training equipment activities, preparing the activity site.

5) Implementation of PKM Activities

The implementation of PKM activities was carried out collaboratively between a team of lecturers and students at Uniska Kediri, tourism service business practitioners, the Self-Help Agriculture and Rural Training Center, and Mejono Village farmers. The series of PKM activities begins with counseling followed by training and mentoring.

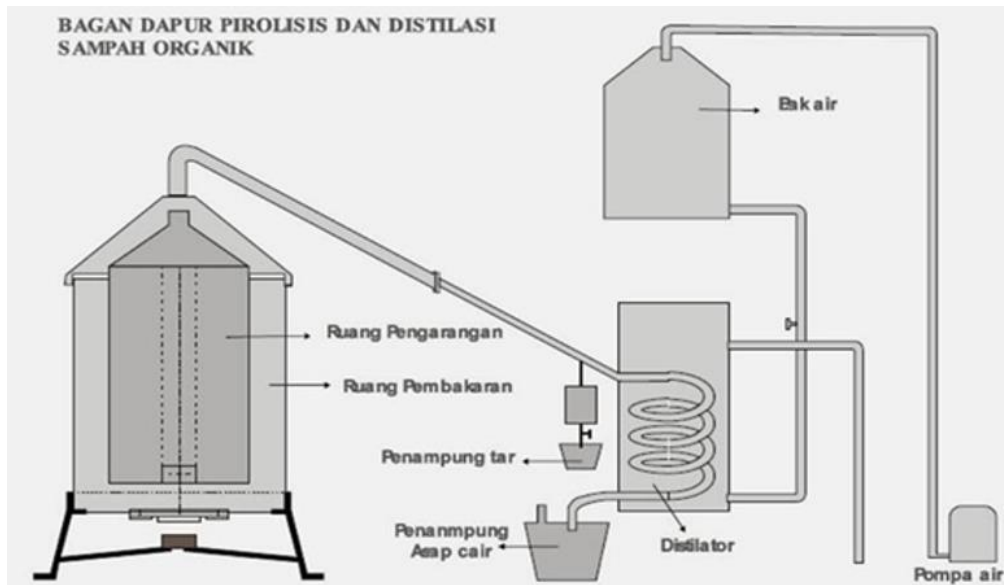


Figure 1. Liquid Smoke Manufacturing Process

6) Assessment and Evaluation of PKM Activities

The implementation of the PKM activity assessment and evaluation aims to measure the level of achievement of the results of PKM activities in achieving goals and long-term sustainability of activities.

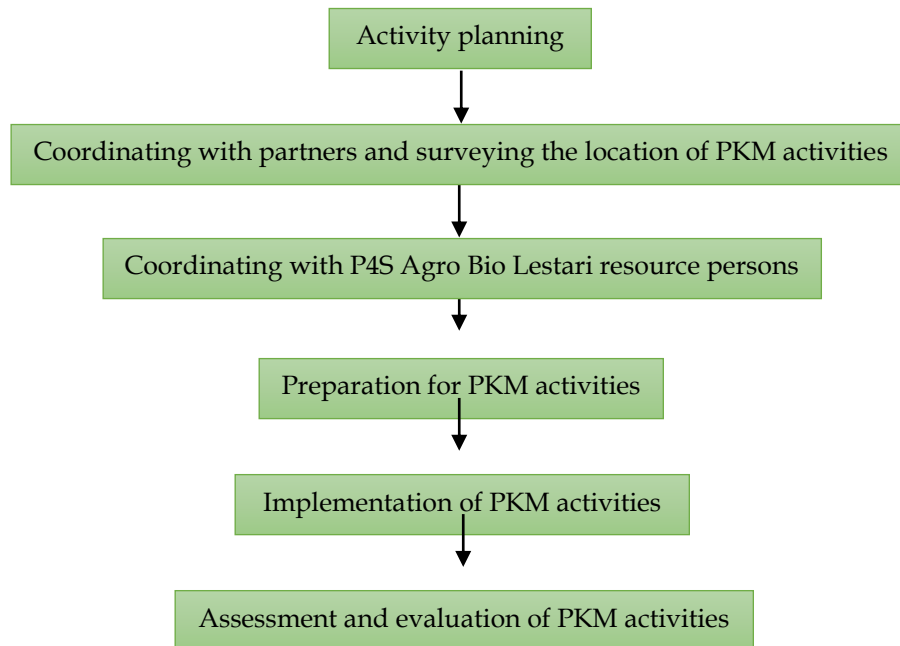


Figure 2. PKM Activity Flow

RESULTS AND DISCUSSIONS

Activity Planning

Coordination meeting activities with the PKM team resulted in an event committee arrangement and division of tasks involving personnel from Uniska Kediri students. There are 6 personnel from students who help carry out technical activities in the field. In this stage, the achievement of activities and standards for measuring PKM activities are determined. Preparation of the budget planning script, activity time, implementation and evaluation of activities takes approximately 2 weeks.

Coordinate with Partners and Survey the Location of PKM Activities

The PKM team visited several times to communicate and coordinate with partner teams. The number of cleaning personnel at the Gronjongwariti water tourism site is 12 people. All were involved in collecting dry bamboo leaf waste for 1 week. Dried bamboo leaves are stored in sacks as a raw material for making liquid smoke. The location of the activity is divided into two, namely the extension location and the training location. The extension location is located in the blank hall, while the training location is in the trash incineration room. The resulting liquid smoke is then applied to the rice and secondary crops owned by 2 residents of Mejono Village.

Coordinate with Resource Persons P4S Agro Bio Lestari

Coordination activities with resource persons were carried out 2 weeks before the PKM event was held. The resource person invited was the head of P4S (Self-Help Agriculture and Rural Training Center) Agro Bio Lestari. The profiles of the informants are organic pesticide practitioners with more than 10 years of experience. The Uniska Kediri PKM Team collaborated with resource

persons in carrying out counseling and training activities in making liquid smoke from dry bamboo leaves.

Preparation for PKM Activities

Preparation for PKM activities includes: 1) preparation of material to be delivered, 2) preparation of materials, tools and equipment for training activities, 2) preparation of documentation and accommodation, 3) preparation of minutes and attendance of participants. The day of counseling and training activities is in accordance with the agreement with the Gronjongwariti water tourism manager. While the mentoring activity day is carried out once a week.

Implementation of PKM Activities

The training activities were carried out for one day starting at 09.00 until finished. The number of activity participants was 30 people, consisting of the cleaning team for the Gronjongwariti water tourism spot, residents of Mejono village who work as farmers, lecturers and students of UNISKA Kediri. The raw material used for making liquid smoke is dry bamboo leaves. There were three activity sessions attended by all participants, the first was a question and answer counseling session, the second was a training and question and answer session, the third was a practical session on making product labels, packaging strategies, promotion strategies, and selling strategies for liquid smoke products. In the counseling session, participants received material about liquid smoke and its benefits. Counseling was delivered by resource persons from Agro Bio Lestari and the Uniska Kediri PKM team. After delivering the material, it was followed by a question and answer session and technical delivery of training activities.



Figure 3. Counseling Activity Participants



Figure 4. Training Activities

The tools used to make liquid smoke were assembled by the management team of the Gronjongwariti water tourism spot. This activity requires assistance with the installation of the tool until it can be used. To be able to assemble liquid smoke production equipment, you can follow the steps below.

- 1) Prepare the Composition container, combustion chamber, tar/liquid smoke container, which can be made of stainless steel or modified iron drums as shown in the picture.
- 2) Modified iron pipe shaped like the picture
- 3) Condenser/cooler (used freon tube)
- 4) Iron pipe (adjustable quantity and size)
- 5) Tubes / drums

In addition to self-assembly, many production machine manufacturers have provided liquid smoke production machines, so that the management team for tourist attractions can buy directly at the store as needed.



Figure 5. Installation of Liquid Smoke Production Equipment

The process of making liquid smoke follows the following flow.

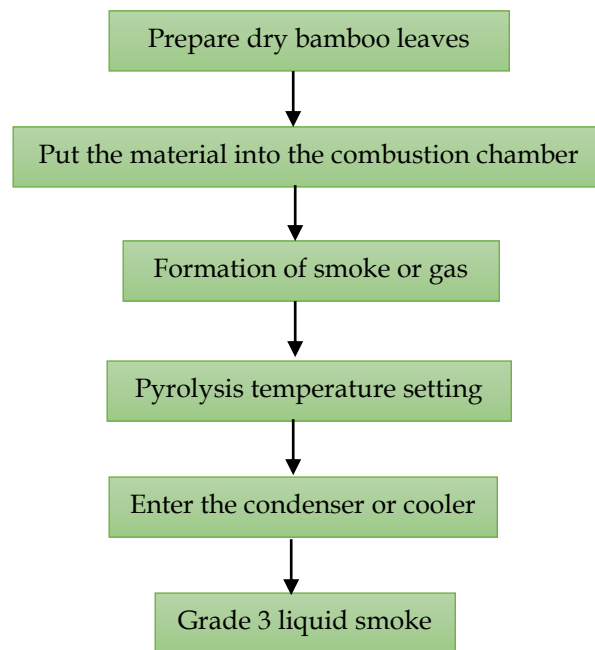


Figure 6. Grade 3 Liquid Smoke Manufacturing Flow

Assessment and Evaluation of PKM Activities

The process of assessing and evaluating PKM activities is carried out during the activity and after the activity ends. Measurements are adjusted based on utilization standards and see their effectiveness. The guidelines used in the process of monitoring and evaluating liquid smoke products are:

1. Liquid smoke effectively controls grasshopper and caterpillar pests *Prodenia Litura*, stink bug, mealybug pest (*Ceratovacuna Lanigera*), blendek disease (*Phytohthera sp.*) on tangerine plants with a ratio of 1:15 liquid smoke.
2. Liquid smoke is effective in controlling termites, mosquitoes, ants with a dose of 15-20 ml/lit every three days in the affected area.
3. Liquid smoke effectively accelerates plant growth vegetatively, with a dose of 20 ml/lit every 2 weeks, sprayed on the leaves or watered through the roots.
4. Liquid smoke is effective as a fertilizer, by spraying liquid smoke with a concentration of 5 ml/lit above the surface of the leaves on young plants. Whereas in mature plants, liquid smoke solution is sprinkled around the roots every two weeks.



Figure 7. Grade 3 Liquid Smoke Packaging

The assessment and evaluation of PKM activities is measured based on the knowledge and skills of the participants in understanding the material and carrying out practical activities for making liquid smoke. The PKM team measures assessments based on five knowledge criteria and five skills criteria.

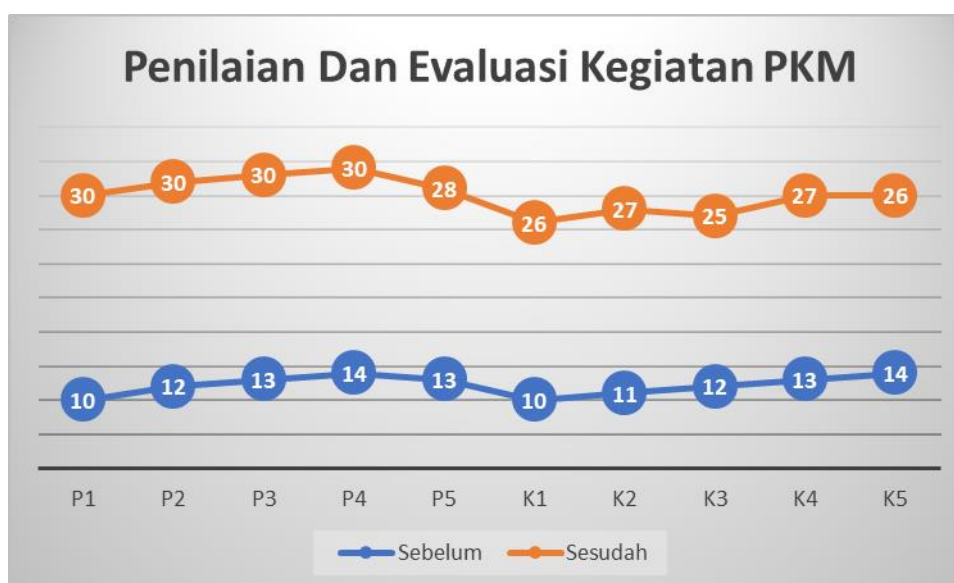


Figure 8. Results of Assessment and Evaluation of PKM Activities

Knowledge 1 (P1) participants know about liquid smoke and its function, which was previously 10 people increased to 30 people. Knowledge 2 (P2) participants know the materials that can be used to make liquid smoke, which previously had 12 people increased to 30 people. Knowledge 3 (P3) participants know the equipment for making liquid smoke, which previously had 13 people increased to 30 people. Knowledge 4 (P4) participants know how to make liquid smoke, which previously had 14 people increased to 30 people. Knowledge 5 (P5) participants know the technique of using liquid smoke for plants, which previously had 13 people increased to 28 people.

Skill 1 (K1) participants can process bamboo leaf waste into grade 3 liquid smoke, which previously had 10 people increased to 26 people. Skill 2 (K2) participants can operate liquid smoke making equipment which previously had 11 people increased to 27 people. Skill 3 (K3) participants can use grade 3 liquid smoke for plants, which previously had 12 people increased to 25 people. Skill 4 (K4) participants can carry out the liquid smoke production process independently, which previously had 13 people increased to 27 people. Skill 5 (K5) participants can design liquid smoke production equipment independently, which previously had 14 people increased to 26 people.

CONCLUSIONS AND RECOMMENDATIONS

Community Service Activities in an effort to empower the people of Mejono Village through processing bamboo leaf waste into grade 3 liquid smoke have been successfully carried out properly and smoothly. This PKM activity is limited to one type of liquid smoke, namely grade 3 which can be used to support agricultural and animal husbandry activities. In agricultural activities, liquid smoke functions as a biopesticide including: insecticide, fungicide and bactericidal, organic fertilizer, rubber processing, namely as a preservative and deodorizer. In animal husbandry activities, liquid smoke serves to sterilize cages which are useful for organic disinfectants and removing ammonia odors, as well as external wound medicine for animals. The target of increasing the knowledge and skills of Village residents and the planned output has been achieved.

The use of bamboo leaf waste to turn into liquid smoke is an innovation worthy of development and a new business opportunity that can be followed up by the management of the Gronjongwariti water tourism spot. The activity of processing bamboo leaf waste into liquid smoke must be sustainable. Further PKM activities can be developed with the target of producing grade 1 and grade 2 liquid smoke in order to provide greater added value to the community. Collaboration with stakeholders is needed, one of which is UNISKA Kediri lecturers and students to follow up on the production and marketing of liquid smoke products on a large scale. There needs to be a business partnership with the village government and the surrounding community in supporting the sustainability of this activity.

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