Woman Empowerment Model Based Physalis angulata L. to Fight Poverty in Rural Area

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Abstract

Physalis angulata L. is Indonesian Neglected Underutilized Species (NUS) plant because it's entirely ignored by agricultural researches, plant breeders, and policymakers. Meanwhile, Physalis angulata L. or ciplukan are identified growing in many regions of Indonesia. In another side, ciplukan plants are potentially for synthetic nutraparm material because it has complex nutrition for noncommunicable diseases (NCDs) such as diabetes. So, project which is done by sociopreneur concept can be developed as an effort to empower women in the village through increasing the capability of Women Farmers Community (WFC) in Sipiran Village, Pagaralan District, Malang. This activity was held from October 2018 until February 2019 using the Participatory Rural Appraisal (PRA) method which was carried out group training and mentoring such as: ciplukan cultivation, packaging and product marketing. The results of this activity showed high enthusiasm and cohesiveness through sustainability of the program and increase women group farmer's income than before.

Keywords: Ciplukan, Neglected Plant, Woman Empowerment, Sociopreneur, Poverty

1. Introduction

Ciplukan (Physalis Angulata L.) is a herbaceous family solanaceae plant that has been identified to spread in tropical regions including Indonesia. This plant has a characteristic shape that resembles tomatoes with fruit wrapped by Calyx. The distribution of genetic properties of ciplukan germplasm in Indonesia can be seen from the various local names from various regions in Indonesia, namely: leletop, bobo leaves, kapokapo leaves, latolato leaves, leletep, depuk-depuk (Sumatra); ecceder, ciplukan (Java); kaciputan (Bawean); nyornyoran, yoryoran, (Madura); kekop-kepokan, kecepetokan (Bali); kenampokan, dedes (Lombok); late (Flores); karuhuk, antokop (Kalimantan); leletopan, leletokan, kopo-kopo leaf, loto-loto leaf, lupareho, valanpanga, kateo-teo, roiy (Sulawesi); bobo leaves, lapinonat, lapunonat, dagameme (Maluku); kakuto, gekatomato (Papua) (Waluyo and Zanetta, 2018). Variations in local names indicate that the genetic germplasm of the ciplukan plant is spread and utilized by Indonesian people locally. Ciplukan has the potential to be identified as a nutraparsmetikal biopharmaca plant because it provides health or medical benefits, including prevention and treatment of diseases. (Chaidir et al, 2015; Dawson et al, 2007; Frison et al, 2011; Padulosi et al, 2013; Verheijet al, 2007).

In vitro studies show that Physalis angulata L. contain secondary metabolic compounds such as physalins (A, B, D and F), malic acid, alkaloiuds, tannins, cryptoxanthine, provitamin A, vitamin B complex and vitamin C, and glycosides (e.gMyricetin-3-O-neohesperidoside) which has various health benefits. Extracts or infusions of ciplukan plants have been used in many countries as popular drugs for the treatment of diseases such as malaria, asthma, hepatitis, dermatitis and rheumatism. Ciplukan plants can be anti diabetic, hypertension, analgesics (pain relievers), diuretic, anti-cancer to antitumor, neutralizing toxins, relieving coughing, activating the functions of the glands of the body, optimizing insulin function for diabetes. (Silva et al, 2006; Soares et al, 2006; Sutjaatmoet al, 2011).

Ciplukan plant has the potential to be developed as a cultivation plant for the source of exotic fruit to be used as nutrasetikal and pharmaceutical ingredients with high nutrient content. This plant which is classified as neglected and underutilized species (NUS) can provide important micro nutrients to supplement the
nutrition of staple foods consumed by the community. *Ciplukan* is also an alternative plant which supports the reduction of malnutrition through local exotic fruit.

Some people in some areas such as Yogyakarta and Blitar utilize local ciplukan fruits from the wild *Physalis Angulata* L. species that have been traded as fresh fruit in traditional markets. These fruit traders usually collect from needed seekers obtained from wild plants in dry fields or yards. The sale is done very simply by tying the *ciplukan* fruit which has been peeled from the calyx lined up without being packed and also labeled. This makes the appearance of fruit less attractive and not uniform which causes fruit marketing become not optimal. In order to optimize the value proposition to produce high revenue streams, it can be done in a targeted manner. *Ciplukan* cultivation process can involve a group of women farmers as the subject of management.

The government's efforts to overcome poverty in the agricultural sector cannot be separated from the need to include women in the every activities of agricultural sector, from planning to implementation. The involvement of women equal to men has a very important meaning for improving the economy of an agrarian society. This is not only because of the strategic role of women in the household, but also because women play a role as a support for family needs to cover uncertain and insufficient agricultural income. Since this issue was arranged on Sustainable Development Goals (SDG’s) number 5 about “Gender Equality”, women take important roles in local economic activities and fulfill their household socio-economic needs. It is appropriate for the position of peasant women to be counted as the subject of empowerment on par with men.

Sipring Village, Pagelaran Village, Pagelaran District, Malang Regency is one of the areas found in many *ciplukan* areas that grow wild in the yard to the area of plantation residents. The community relies on the main income of the family from male-dominated agricultural activities. The majority of women in Sipring Village work as housewives with keen knowledge about agriculture because they often help in making decisions in agricultural activities in their families. It is important as an effort to encourage women's participation in the activities of agriculture. The tactical position of women as important position takers in local economic activities and the fulfillment of household socio-economic needs can be directed at productive activities as an effort to empower women. The model of women's empowerment is an effort to find a pattern that can be used sustainably in developing the potential of women's societies in a village. The development of a model of women's empowerment in agriculture by utilizing local plants such as *ciplukan* is important to be initiated as an effort to develop group capability by utilizing existing local potential. The implementation’s purpose of this activity was to encourage the establishment of a women's empowerment model in Sipring Village, Pagelaran Village, Malang Regency in the field of agriculture through the use of *ciplukan* local plants as an effort to fight poverty in rural areas. In this model a group of female participants is based on age, and also occupation. This model is also carried out with the model of increasing the capability of women's groups in the simulation implementation of the cultivation of *ciplukan* until the product packaging stage. So that the model can be said to succeed the independence of women's groups in utilizing the potential of local plants.

### 2. Method

In this study, the method of Participatory Rural Appraisal (PRA) was used where in its application, PRA prioritized in-depth understanding of the subject rather than statistical information (Adimihardja, 2004). In other words, the community in this case is seen not as an object, but as a subject in a community empowerment program. This community service is carried out in 2019 in Sipiring Village, Pagelaran Village, Malang Regency. The goal is to improve the quality of human resources through the utilization and optimization of personal abilities, especially women (woman empowerment) to remain productive, creative, and have their own income. The following are the stages of the activities carried out

<table>
<thead>
<tr>
<th>No</th>
<th>Activity Plan</th>
<th>Involvement in Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Preparation</td>
<td>Implementation Team</td>
</tr>
</tbody>
</table>

Potency Identification | Team make a potency identification in the location | Group follows as participant to identification the potency
Socialization | Team do socialization | Group follows the socialization
Preparation Tools and Materials | Team provide preparation tools and material which is needed by the participants | Group of participants helps to prepare tools and materials, also determine the place for activities

2. Program Implementation

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing of seed gardens</td>
<td>Giving a concept of making seed gardens that used to breed <em>ciplukan</em> plant</td>
<td>Cooperating in making seed gardens breeding</td>
</tr>
<tr>
<td>Training and mentoring of <em>Ciplukan</em> plant</td>
<td>Providing tools and materials and seeds to be sown together</td>
<td>The group actively practices breeding</td>
</tr>
<tr>
<td>Training and Mentoring for <em>ciplukan</em> cultivation</td>
<td>Providing practical training, mentoring, and cultivation of <em>ciplukan</em> plants</td>
<td>The group actively practices plant maintenance and provides responses in accordance with experiences that have been carried out</td>
</tr>
<tr>
<td>Training and mentoring for harvest and post-harvest activities</td>
<td>Provide training and assistance in fruit grading activities to determine the quality of fruit</td>
<td>The group carries out fruit grading activities and can determine the quality of the fruit according to the standard to be packaged</td>
</tr>
<tr>
<td>Training and mentoring for packaging and labelling of product</td>
<td>Provide post-harvest training and assistance to <em>ciplukan</em> products by packaging so that they have good packaging</td>
<td>The group conducts packaging activities for <em>ciplukan</em> products with good and attractive packaging</td>
</tr>
</tbody>
</table>

Table 2. Indicators of Successful Activity

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The group understands the basic ideas of the program to be carried out</td>
<td>The group does not understand the aims and objectives of the empowerment activities program</td>
<td>The group understands and knows the direction of the activities to be carried out</td>
</tr>
<tr>
<td>2.</td>
<td>Group member’s knowledge about <em>ciplukan</em> plants</td>
<td>The group member only knows that <em>ciplukan</em> is a weed and wild plant that can be consumed and has no value</td>
<td>The group knows various types of <em>ciplukan</em> plants, the nutritional content and benefits of <em>ciplukan</em> plants for health</td>
</tr>
<tr>
<td>3.</td>
<td>Availability of nursery facilities and infrastructure</td>
<td>The group does not have yet nursery facilities for planting <em>ciplukan</em> seeds</td>
<td>Availability of nursery facilities and infrastructure</td>
</tr>
<tr>
<td>4.</td>
<td>Group knowledge and skills in the nursery of <em>ciplukan</em> plants</td>
<td>The group only know that <em>ciplukan</em> only grow wild doesn’t need to be nurled</td>
<td>The group can hatch <em>ciplukan</em> plants independently and practically</td>
</tr>
<tr>
<td>5.</td>
<td>Group knowledge and skills in the maintenance and cultivation of <em>ciplukan</em> plants</td>
<td>Participants don’t know how to cultivate <em>ciplukan</em> plant</td>
<td>Increased knowledge and skills of the group in treating <em>ciplukan</em> plants</td>
</tr>
<tr>
<td>6.</td>
<td>Group knowledge and skills in harvesting and grading <em>ciplukan</em> fruit</td>
<td>The group does not have knowledge about fruit grading and harvesting activities</td>
<td>The group has knowledge and able to sort <em>ciplukan</em> which has been harvested according to the fruit quality standards</td>
</tr>
</tbody>
</table>
3. Result and Discussion

Community service activity is carried out in Sipiring Village, Malang City. This community service activity begins with coordination with village officials and woman group (Angrek Kelompok Wanita Tani) to recognize the problems and potential that exist in Pagelaran Village in agriculture and food. From the coordination, a solution was found in the form of women's empowerment model by utilizing *ciplukan* wild plants (*Physalis angulata L*). The implementation results of the activities can be seen in the table 3.

<table>
<thead>
<tr>
<th>No.</th>
<th>Program</th>
<th>Result Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Socialization</td>
<td>After conducting socialization activities related to the Women Empowerment Model, the Women's Farmers Group (Kelompok Wanita Tani) in Sipiring Village has better understanding and knowledge about the program and its activities</td>
</tr>
<tr>
<td>2.</td>
<td>Program Orientation</td>
<td>After the program orientation is carried out in more detail with the explanation of the stages, agreements, and program schedules, the Women Farmers Group (Kelompok Wanita Tani) in Sipiring Villages more focused in conducting activities</td>
</tr>
<tr>
<td>3.</td>
<td>Training and mentoring of <em>ciplukan</em> plant breeding</td>
<td>Sipiring Women Farmer Group (Kelompok Wanita Tani) in Sipiring Village is more independent in conducting breeding and utilizing wild plants so that it becomes a potential plant</td>
</tr>
<tr>
<td>4.</td>
<td>Training and mentoring of <em>ciplukan</em> cultivation</td>
<td>Participants will get new knowledge about breeding, maintenance, and harvest of <em>ciplukan</em> plants. The level of participation in training was also very good, which was shown by the enthusiasm of the group in participating in the activity.</td>
</tr>
<tr>
<td>5.</td>
<td>Assistance with <em>ciplukan</em> crop grading</td>
<td>The Women Farmer group (Kelompok Wanita Tani) in Sipiring Village has the knowledge about <em>ciplukan</em> grading and sorting that has been harvested according to predetermined standards.</td>
</tr>
<tr>
<td>6.</td>
<td>Product packaging &amp; labeling training</td>
<td>The group can make better and more attractive product packaging so that it has high selling value in the market</td>
</tr>
</tbody>
</table>

3.1 Initiating WEM (Woman Empowerement Model)

3.1.1 Identification of problems

Based on the results of the coordination with the Sipiring Village official, it was found that a high level of economic dependence on the family head. So that the level of welfare only relies on men's work. Therefore, it is necessary to empower women groups to support the level of welfare through increasing community income.

3.1.2 Dissemination of the Woman Empowerement Model (WEM) Program

This empowerment model is focused on women. The program is in collaboration with Farmers Women's Group in Sipiring Village, Pagelaran Village, Malang Regency. This empowerment model will be carried out by grouping women in Sipiring Village based on population in the neighborhood (*Rukun Tetangga*). This grouping has aimed to facilitate the mobilization of activities and interaction among participants. The first step in the initiation of this empowerment model is to recognize the potential of women in Sipiring...
Village to be matched with the potential empowerment model of the ciplukan plant. Matching this potential is important as an initial step in an effort to optimize the WEM program. The potential of women in Sipiring Village was found in the form of skills and knowledge in the field of agriculture which was quite good, so that it had great potential if training and mentoring were carried out on agricultural activities.

The benefit of this program also can introduce *ciplukan* as wild plant that has high nutrition content for health. *Ciplukan* plants are rich in active flavonoids with the percentage of fruit extract 300 µg / ml is 84%, fruit extract 200 µg / ml is 58% and in 100 µg / ml extract (Fitri, 2016). *Ciplukan* has also been widely used in medicine for wound healing, inflammation of the liver, malaria, venereal disease, rheumatism, ear pain and has analgesic, detoxifying (toxin remover), antitumor, and inhibits the growth of cancer, especially colon cancer (Aldi, 2014).

### 3.2 Training for Empowerment Programs

#### 3.2.1 Seedling

Seedling activities are the initial activities of the agricultural cultivation process. This activity begins with the making of seeding media in the form of husk charcoal, manure, and soil with a ratio of 1: 1: 1. *Ciplukan* seedlings used were local *ciplukan* seedlings from the plant Seedling research conducted before the project was carried out. The seeds to be sown are washed first with ash water to remove the liquid attached to the seeds so that the seed vigor can be maximized until the final process is rinsed with clear water. After the seeds are ready, seeding is carried out to the planting media that have been provided. Seedling treatment is done by watering the seeds once a day in the morning. The group is monitored to carry out these activities periodically so that the monitoring ratio of seed growth can be controlled.

![Figure 1. Ciplukan Seedling. a) Filling babybag for seedling, b) Ciplukan Seedling, c) Ciplukan Seed Growth](image1)

#### 3.2.2 Plant Treatment

Treatment activities are important activities in cultivating *ciplukan* plants. The process of maintaining *ciplukan* plants is to be KWT routinely watered at least once to twice a day depending on the level of soil moisture. In addition, fertilization is carried out to add nutrients in the soil. Because *ciplukan* plants are quite easy to cultivate, then adding organic fertilizers such as chicken manure can be a solution to increase the availability of nitrogen (N) in the soil. Nitrogen is one of the elements needed in a plant because it can prevent necrosis of the leaves, accelerate the growth and flowering of *ciplukan* plants. Weeding on *ciplukan* plants is also important to be done in order to reduce the number of weeds or unwanted plants in ciplukan cultivation. Weeding can be done in traditional ways such as removing weeds or using herbicides.

![Figure 2. Ciplukan Cultivation. a) Ciplukan fruit in woman backyard, b) Ciplukan Plant in another backyard](image2)
3.2.3 Harvest
Ciplukan crop harvest can be carried out after 3 months where the ciplukan flowers and fruits have appeared a lot and are ready to be taken. After harvesting, the next step is the grading process where sorting is carried out so that the selected fruit is a fruit that has good quality and quantity so that it is suitable to be produced.

3.2.4 Post-harvest
Ciplukan fruit harvest will later be packaged and labeled which will be marketed in collaboration with the local KUD. The packaging and labeling process will be carried out directly by using mica and logo stickers to increase the selling value of ciplukan fruits. Based on this, the Women Farmer Group (Kelompok Wanita Tani) in Sipiring Village gets additional sources of income from wild plants which previously were only considered one eye so that economic independence was created. This is in accordance with the statement (Kartasasmita, 1996) that women's empowerment is to empower women to be equal to men and actively involve in increasing income and welfare, in order to accelerate equitable development.

Figure 3. Ciplukan Harvest. a) Ciplukan harvest from woman backyard, b) Ciplukan Fruit Grading

3.3 Assistance to the Woman Empowerment Model (WEM) Program
The assistance activities were carried out after the training activities where the committee as a facilitator continued to accompany the Women Farmers Group (Kelompok Wanita Tani) in Sipiring Village to conducting the WEM program. After the training in ciplukan cultivation activities ranging from seedling, maintenance, harvesting, and post-harvest, the Farmers Women's Group (Kelompok Wanita Tani) in Sipiring Village had more skill in utilizing ciplukan plants into a product that has a high selling value. With this, more women are not only relying on income from men, but can help family income with the skills they have.

Figure 4. Ciplukan Packaging. a) Ciplukan packaged by woman village, b) Ciplukan simple package

3.4 Monitoring and Evaluation
Based on the process of women's empowerment efforts in Sipiring Village which began with socialization activities, program orientation, training, and mentoring, it can be said that the enthusiasm of the participants was quite high. This can be seen from the attendance and interest of participants in following the activity process. In addition, participants also actively participated in question and answer activities and discussions with the committee. So that there is cohesiveness in the implementation of women's empowerment in Sipiring Village, Pagelaran Village, Malang Regency. This is linier with the statement of Mimbar (2015)
that the indicators of the success of the empowerment program under UNICEF are divided into 5, namely welfare, access, critical awareness, participation, and control. Based on these indicators, the description of the empowerment program that will be applied in Sipiring Village is in line with the success of the empowerment effort. The Woman Empowerment program can help to improve welfare, self-awareness to be more productive and change inequalities, and active participation in empowerment activities. So, it is expected that this program can be useful in improving the skills of women in Sipiring Village and making the woman empowerment model as a sustainable model.

4. Conclusions

In the Women’s Empowerment model program, seedling, treatment, harvesting, product packaging and labeling are provided with a field school to improve the participant's skills. This women's empowerment program is an appropriate model to be implemented in Sipiring Village Malang Regency, East Java Province. This can be seen from the enthusiasm and cohesiveness of the participants in participating in the program's socialization and orientation. In addition, the existence of this empowerment model can also increase the source of income for women in Sipiring Village, Pagelaran Village, Malang Regency, East Java.

Acknowledgment

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