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"Seed Bag" Production Implementation as an Oriented Critical Institutional Revegetation in "Green Economy"

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***Abstract*— The purpose of this study is to introduce a new method of revegetation of critical land using seed bag to restore the carrying capacity of the land which is diminishing due to natural disasters. This study took place in the Ledek Mountain area of Semarang State University. The variables of this research were the conditioning of the planting media and the treatment of growing sprouts and vegetative in the seed bag. The seeds of the plant that were filled can be in the form of cover crops, perennials, bamboo, and others. This seed bag technology was expected to boost the revegetation process. Seed bag can hold soil bonds from scouring water, facilitating land rehabilitation, and protecting other economic assets. Popularizing the green economy can be done by restoring degraded land while producing fodder, tree crops, fruit and other landscape functions.**

Keywords—component; seed bag; revegetation; critical land.

I. INTRODUCTION

As a result of global climate change, there are many natural disasters, including floods and droughts, which have caused land carrying capacity to decline resulting in landslides. Land use that ignores the principles of conservation of land and water also has the potential to cause land degradation which will ultimately lead to critical land. Critical land that is formed as a result of disasters that occur due to water shortages and land that has weak or reduced land preparation ties, thus creating lands that are prone to landslides, eroded or washed away of the harbor.

The current economic development has demanded changes in the landscape and land balance, resulting in a shift in the land function or its carrying capacity. Hence, the need for the concept of mitigation of critical lands instantly to avoid greater damage, protection. This is needed by the community to protect agricultural land assets, capital assets, and agricultural infrastructure. Generally, the community or stakeholders subscribe to degraded land using natural vegetation due to cost considerations and people's perceptions of the effectiveness of plant use in land protection, but the reality in the field of vegetation planting cannot be directly carried out on degraded land due to water factors, potential disasters aftershocks and the presence of water, because the vegetation in the garden itself needs intake from the soil if only the land is used as a mainstay or the main weapon in the protection of the land, then without vegetation, there will also be scouring, so that the combination of soil and vegetation needs to be used as a subscription package.

The concept of natural conservation touch for a new equilibrium is needed so that there is no further destruction because the concept of instant vegetation in critical land subscriptions needs to be examined and practiced more broadly, by combining the presence of soils and plant varieties such as cover crops, fruit plants, perennials, forage plants feed leaves, bamboo plants, vines, so that they are oriented to the greenhouse.

Critical land according to the results of the Symposium on Prevention and Recovery of critical land in 1975, is defined as land that is not following the use and its ability has been experienced or in the process of physical, chemical, and biological damage that ultimately endangers the hydrological and orological functions, production agriculture, as well as settlement and socioeconomic life of the surrounding area. According to the Ministry of Forestry, critical land is the land that is no longer functioning as a medium for regulating water and good agricultural production elements, characterized by a state of vegetation cover <25%, topography with a slope> 15% and or characterized by symptoms of sheet erosion and ditch erosion [1]. According to the Ministry of Agriculture, critical land is the land that is currently not or less productive in terms of agricultural use, because the management or use does not pay enough attention to the principles of soil conservation [2].

According to [3], land criticality can initially involve one or more land factors, such as climate, soil, topography, flora, and fauna, or some of them at once. However, because of land factors are in a system boundary, the criticality of one factor can eventually spread to other factors. Climate which is a soil-forming factor determines the availability of water and affects

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the life of flora and fauna. Therefore, the criticality of climate may cause the criticality of soil, flora, and fauna. Furthermore, due to human intervention, the occurrence of land use over its carrying capacity without being balanced with conservation efforts and improvement of land conditions will often cause land damage. For example, land in upstream areas with steep slopes that are only suitable for forests, if they are converted into agricultural land for annual crops will be vulnerable to erosion and / or landslides.

Changes in permanent vegetation cover (forests) caused by changes in land use into intensive agricultural land make the soil more easily degraded by soil erosion. As a result of degradation by this erosion can be felt with the expansion of critical land. Forest felling and destruction practices (deforestation) are the main cause of erosion in watersheds areas. Damage caused by erosion is not only felt in the upstream (on-site), but also affects the downstream (off-site) of a watershed. Damage in the upstream causes a decrease in soil fertility and affects the deterioration of soil productivity or the expansion of critical land.

Damage in downstream is caused by sedimentation which causes the siltation of waterways and rivers and resulted in flooding in the rainy season, and drought in the dry season. Soil erosion is a major factor causing the unsustainability of farming activities in the upstream area. Intensive erosion on agricultural land causes a decrease in land productivity due to the loss of fertile topsoil and resulting in hard rock layers. A decrease in land productivity will directly be followed by a decrease in farmers' income and welfare. Besides causing unsustainability of farming in the upstream area, the farming activities also cause damage to land and environmental resources in the downstream area, which will cause unsustainability of some productive economic business activities in the downstream region due to sediment deposition and damage to irrigation facilities.

The term critical can contain various meanings, in [2] there are at least three critical land meanings, namely critical relating to their physical-chemical state, social economically critical and hydro-orologically critical. On this land, there are one or more inhibiting factors that are less supportive in exploiting efforts for agricultural activities. In general, the definition of critical in this case is associated with damage experienced by a piece of land so that the land cannot function as expected or is unable to support plant growth normally. Previous research related to optimizing productivity and quality of degraded land has been carried out using reforestation and reforestation, but previous studies have not integrated the existing technical factors, namely the role of land and vegetation, so the results obtained are not as maximized as possible. This research uses a lot of cover crops such as Legume Cover Crop (LCC), perennials such as ketapang and albasia, lee kwan yew vines and dollars, fodder forage plants, mango fruit plants, rambutan, and salak. Therefore, the purpose of this study is to introduce a new method of revegetation of degraded land using a seed bag to restore the reduced carrying capacity of land due to natural disasters.

II. Research Methods

This study focused on improving the quality and productivity of critical land-based on renewable seed bag technology. The location of the study was conducted at Mount Ledek, Gunung Pati Subdistrict, Semarang City. The types of data in this study were divided into two, namely primary data and secondary data. This research focused on improving the quality and productivity of critical land-based on renewable seed bag technology. Primary data obtained in the form of verbal or words and behavior of subjects (informants) associated with the study. Meanwhile, secondary data was sourced from documents, photographs, records and objects used as complements to primary data. The selection of informants was done by using purposive sampling technique.

To obtain data holistically and in integrated way and pay attention to the relevance of the data with the focus of research, problem formulation and objectives, the data collection using techniques: (1) in-depth interviews; (2) observation; (3) Focus Group Discussion; (4) questionnaire; (5) documentation study; and (6) laboratory testing.

Test methods done by taking soil samples for laboratory analysis so that the level of damage or criticality of the land can be seen, which can be a reference for more precise handling, the testing of bag strength used against ultra violet rays, and the selection of seeds.

III. Results and Discussion

Land Revegetation Based on Ministerial Decree PE No.1211.K / 008 / M.PE / 95, reclamation is defined as activities aimed at improving or managing disrupted land use as a result of general mining business activities, in order to function and be efficient in accordance with its allotment. In accordance with the definition, the main purpose of reclamation is to make damaged or useless areas better and more useful. Revegetation according to Minister of Forestry and Plantation Decree No. 146 of 1999 is a business or activity of replanting on ex-mining land. Revegetation is carried out through the stages of the activities of preparing the technical design of plants, field supplies, procurement of seedlings, planting, and maintaining of plants.

Revegetation is one of the main pillars in peat restoration where its activities are aimed at the restoration or rehabilitation of vegetation of a land after disturbance or damage. In its implementation, revegetation is integrated with two other pillars of peat restoration namely rewetting and revitalizing livelihoods. Revegetation activities must be carried out in accordance with the correct methods and procedures. Furthermore, revegetation activities should involve all parties, especially the community, in order to be able to provide added value to them and to ensure the continuity of the program in the future. In contrast to other activities, revegetation has more severe challenges because the ultimate goal of the activity is not how many plants are planted, but how many plants survive. Based on this, revegetation activities must be well planned and seriously implemented. The process of revegetation activities will determine the outcome of an activity.

A. Plant Type, Location, and Intervention Options

The types of plants for revegetation of peatlands should put forward as far as possible the native species that grow in the forest. The selection of plant species should not only focus on the type of 2 commercial trees but also other species that have an important role (for example fruit producers, animal habitats, land cover, etc.). Planting with many types is highly recommended so that the composition of the stands resulting from revegetation activities has high biodiversity. And vice versa, planting species or few species should be avoided. Planting patterns and activity arrangements can vary according to land cover, location of planting location, thickness of peat, and status of land ownership over the location to be planted. As another alternative, it is made by planting media bags made from burlap material or the like which contain planting media and prepared certain plant seeds that are ready for planting, which is easily absorbed planted in the field, these bags are called "seed bags".

Previous research related to optimizing productivity and quality of degraded land has been carried out using greening and reforestation, but previous studies have not integrated existing technical factors, namely the role of land and vegetation, so the results obtained are not as maximal as possible. This study uses a lot of cover crops such as Legume Cover Crop (LCC), perennials such as ketapang and albasia, lee kwan yew vines and dollars, fodder forage plants, mango fruit plants, rambutan, and salacca.

Legume Cover Crop (LCC) in this study is the main factor because LCC has the nature of increasing soil fertility through symbiosis between LCC plants and soil-binding bacteria to bind nitrogen from the air. This can indirectly bind macro and other micronutrients contained in the soil. Besides, LCC cultivation aims to strengthen the physical structure of the soil to bind to the soil layer and also increase good air cavities in the soil. Thus, this plant becomes a major factor for revegetation of degraded land, because of its great benefits for binding soil elements.

Ground Cover Plants also known as Legume Cover Crop (LCC) are plants that are specifically planted to improve soil structure by improving the physical and chemical properties of the soil so that it can restore soil fertility. This can happen because this plant has a symbiosis with nitrogen-fixing bacteria so that the availability of nitrogen in the soil increases. So, this plant is planted with the aim of improving soil structure so that its fertility returns to increase so that it is ready to be replanted with the main crop.

Considering that the purpose of LCC planting is to improve soil structure so that it can be planted again, LCC plants must meet several requirements, namely: (1) Roots do not disturb the main crops. In this case, the roots of the LCC plant must be roots that are easily extracted, so that they do not leave the remaining roots in the soil that can interfere with the main plant. (2) Easy to propagate vegetatively and generatively and grow fast with the ease of propagation of these plants, the more LCC plants grow so that the faster the fertility is obtained and the more land that can be improved in a short time. (3) Resistant to drought, shade, pests, and diseases. This plant's resistance to various disorders makes this plant not easy to die, so the process of increasing soil fertility is not interrupted. (4) Has the potential to provide high organic material. The potential in question is the ability of these plants to bind substances in the soil to increase soil fertility.

Plants that meet the above requirements are plants from the Leguminosae tribe or commonly known as legume plants. The root of this plant is fibrous acr, so it is easily uprooted and does not disturb the roots of the main plant later. In addition, this type of plant is easy to propagate, easy to grow and also grows fast. This type of plant also has resistance to various disturbances and has the potential to provide organic material to the soil because it can bind nitrogen from free air.

As the name suggests, the Legume Cover Crop belongs to the type of Leguminosae or legume plant. Plants of this type have the ability to bind nitrogen from free air because it is able to symbiose with Rhizobium bacteria by infecting plant roots and forming root nodules. Rhizobium will fix nitrogen from the air so that it increases the availability of nitrogen in the soil.

In the world of agriculture, LCC plays a role in increasing soil fertility. The role given by the LCC in agriculture is quite important to achieve successful agriculture. With the LCC, soil conditions that are ready to be planted can be created and fulfil the elements needed by the main plants. As mentioned earlier, the function of LCC is to increase soil fertility, so in terms of increasing soil fertility, the role of LCC in agriculture includes (1) Increasing the supply of nitrogen in the soil. LCC plants are able to increase the nitrogen supply in the soil because these plants have a symbiosis with Rhizobium bacteria that can fix nitrogen directly from free air. (2) Replaces fertilizer function. LCC plants and fertilizers are fertile to the soil. By planting LCC, farmers do not need to apply fertilizer to restore soil fertility before planting main crops and these plants can become organic fertilizer. (3) Reducing nutrient leaching. By planting LCC plants, the land that has not yet been planted by the main crop is not empty, so that when it rains, the remaining nutrients in the soil will not be washed away by the flow of rainwater. (4) Suppress weed growth. With LCC plants, the soil will be covered and will block the entry of sunlight so that weeds cannot grow. (5) Creating new habitats for natural enemies against pests. The existence of LCC plants can be a place to live for natural enemies of pests that attack the main plant. Thus, farmers can reduce the use of pesticides.

LCC plants also functions as water control. By reducing soil erosion, cover crops often also reduce both the level and quantity of water flowing off the field, which will usually pose a risk to the aquatic environment and downstream ecosystems. The cover of plant biomass acts as a physical barrier between rainfall and surface soil so that rainwater continues to trickle down through the soil profile. With increased water infiltration, the potential for groundwater storage and replenishment of aquifers can be increased.

When ground cover plants are put into the soil, or left on the surface of the ground, it often increases soil moisture. In other situations, farmers try to dry the soil as soon as possible into the soil season. Here soil moisture conservation can be a long-standing problem. While cover crops can help to conserve water, in temperate climates, they can withdraw groundwater supplies in the spring, especially if conditions of climate growth are good. In this case, just before planting, farmers often face a tradeoff between the benefits of increasing cover crop growth and the lack of reducing soil moisture for cash crop production that season.

LCC plants also act as weed control. Thicker cover plants also often compete with weeds during the growth of ground cover plants and can prevent the most germinated weed seeds from completing their life cycle and reproducing. If cover crops are left on the surface of the soil rather than being put into the soil as green fertilizer after stopping growth, it can form an almost impenetrable mat. This drastically reduces light transmittance for weed seeds, which in many cases reduces the rate of weed seed germination.

Furthermore, even when weed seeds germinate, they often run out of the energy stored for growth before building the structural capacity needed to penetrate the mulch cover. This is often called a cover plant overflowing effect. Some cover plants suppress weed growth both during and after death. During growth, these protective plants compete vigorously with weeds for available, lightweight, and nutritional space, and after death, they overflow the next weed flush by forming a layer of mulch on the surface of the soil.

In addition, LCC plants are also pest and disease control. Some cover crops are used as what are called "trap plants", to pull pests away from the main crop and to what pests see as better habitat. Trap plant areas can be erected in plants, in agriculture, or landscapes. In many cases, trap crops are planted during the same season as the food crops produced. The limited land area occupied by trap plants can be treated with pesticides once pests are attracted to the traps in sufficient quantities to reduce the pest population. In some organic systems, farmers will benefit from crop traps by working as a large vacuum that physically pulls from plant pests and leaves the field.

Other protective plants are used to attract natural predators of pests by providing elements of their habitat. This is a form of biological control known as habitat augmentation but is achieved using cover crops. The researchers found that planting several different leguminous protective plants (such as bell nuts, vetch woolly pod, New Zealand white clover, and Austrian winter beans) provided sufficient pollen as a food source led to an increase in the seasonal population in Congdon, which with good time potentially enough introducing predatory pressures to reduce orange thrips pest populations.

In the same way that the nature of allelopathy of cover crops can suppress weeds, they can also break the disease cycle and reduce the population of bacterial and fungal diseases, and parasitic nematodes. Species in the Brassicaceae family, such as mustard, have been shown to suppress fungal disease populations through the release of natural toxic chemicals during the degradation of glucosinolate compounds in their plant cell tissues.

Good preparation for planting LCC will truly ensure the success of planting ground cover legumes, with stages of the process such as (1) The area is cleared of weeds by ploughing and shaking or perhaps by spraying herbicides. (2) Planting can be done after designing and/or drilling work. (3) Peanut seeds must be treated first to facilitate germination so that their growth power can be increased.

The rapid development of beans can occur if the seed germination can be pursued quickly. Ways to quickly sprout beans include (1) Soaking the seeds in water. The seeds are soaked for 2 hours in hot water at 70oC. LCC germination such as C. caeruleum, C. mucunoides, and P. javanica can be accelerated by treatment of hot water before planting, by soaking in water at a temperature of 70oC resulting from the combination of boiling water with cold water. The volume of water must be sufficient to soak the whole seed so that when the seed is soaked the water temperature drops to 50 oC. Soaking is done for 2 hours, the seeds are then removed from the immersion and dried.

2) Soaking the seeds in a glycerin solution. The seeds are soaked for 2 hours in a 60 oC glycerin solution. After soaking, then dried. (3) Soaking the seeds in acidic solution. The seeds are soaked in a solution of sulfuric acid (4% by weight of seeds) using plastic cups or aluminum containers. After soaking the seeds are washed clean to get rid of the effects of acid and dried. (4) Breaking or thinning of the seed coat. The beans are mixed with sand and put into the drum. Then the drum filled with seeds + sand is rotated using a small electromotor (0, 5 HP) 75 rpm until the seed coat looks cracked or eroded.

The Cover Crops Planting Method can be carried out as follows: (1) LCC planting is immediately done after the land preparation work and stakes are over. The depth of the planting hole is 1, 5 cm to reduce the possibility of sinking by rainwater and disappear. If the LCC development is not good, insertion must be done as soon as possible. (2) On a flat to undulating area. LCC seed planting must be done in Portugal by making two rows of holes spaced 0, 6 m and every two rows of holes made spacing 1.8 m in the row two holes. (3) In hilly areas. When the terrace is finished, the LCC seed planting is carried out by the Double Compressed Bands method in the slope between the rows of plants; 2 rows of planting are made, two holes in each side of the hole, and two holes in the second row in the middle right in the row of plants. The distance in the row of holes is 0, 6 m.

The Lee Kwan Yew and the Dollar plants are used in this research because they are very adaptive and easy to maintain, so they can thrive on critical and rocky land. The growth is relatively faster because it does not invest nutrients to form hard stems, also able to colonize an area quickly, especially nutrient-poor areas such as rocks, so as not to aggravate critical land.

Plants originating from Burma have now been bred in various other countries such as India and Australia. This makes Lee Kwan Yew's garden more popular among ornamental plant lovers in the world. Not only that, but the Lee Kwan Yew plant also has several other special things that make it increasingly a favorite of many people.

Not only is it known as the Lee Kwan Yew plant, but in Indonesia, this vine is also known as the 'languished widow', even the Lee Kwan Yew plant has three different scientific names, namely Vernonia elliptical, Vernonia elaeagnifolia, Tarlmounia elliptica. Each scientific name has a meaning that represents the character of the Lee Kwan Yew plant.

Elliptica shows the leaves of the elliptical Lee Kwan Yew plant. While elaeagnifolia means pure and clean like olives, this is seen in the leaves of Lee Kwan Yew's ornamental plant that resembles the leaves of an olive tree. The character of the vines that grow hanging down also makes it known as the curtain creeper.

Before much was learned about the Lee Kwan Yew plant, architects and landscape designers have long used these vines to create vertical gardens. The reason is, Lee Kwan Yew's plants do use vertical places such as walls so that he can stick out the stems and leaves are light. The trunk can spread along 0.5 meters to 3 meters.

Unlike vines that only grow in season, Lee Kwan Yew plants grow throughout the year. How to grow Lee Kwan Yew plants is also fairly easy, these vines are not so dependent on temperature and humidity and only require soil that is easy to absorb water. Even so, the Lee Kwan Yew plant requires full sun exposure.

Lee Kwan Yew plants generally have beautiful white flowers, but there are also those with reddish-white flowers (pinkish-white). The flower of the Lee Kwan Yew plant is composed of petals that resemble thin stems. The existence of the flowers makes the curtain effect created by Lee Kwan Yew plant more attractive. But if you want to maximize the charm of these vines, plant them close together to make them look lush.

Perennials include albasia, ketapang, and so forth. Albasia grows naturally in Sumatra, Java, Bali, Maluku, Papua New Guinea, Solomon Islands, and Australia. It can grow at an altitude of 0-1600 m above sea level, adapt to the monsoon and humid climate with rainfall of 200-2700 mm / y with a dry month up to 4 months and can be planted on an infertile site without fertilization, but cannot flourish on poorly drained land. Ketapang plants (Terminalia catappa L) are types of plants that are very easy to grow and are found in most parts of Indonesia. So far, the use of ketapang plants is more like road shade plants. This perennial is able to keep landslides, especially on hill slopes, absorb, and store water, making it suitable for use in improving land conditions.

Mango plant (Mangifera indica L.) is a tropical fruit that usually grows well in dry climates. Geographical distribution of this mango plant is spread almost all over the world, especially in parts of India which is the country of origin of mango, Sri Lanka, Pakistan, and Indonesia. Mangoes have deep and strong taproots and side roots, which are able to bind the soil elements, so they can become a medium to restore soil quality. Rambutan (Nephelium sp.) is a horticultural fruit plant in the form of a tree with the Sapindacaeae family. This plant can grow well in areas with elevations up to 500 mamsl and can grow in various types of soil. Rambutan plants can grow and produce even if left unchecked without attention, has a deep root system that can prevent erosion and land damage.

Salacca (Salacca edulis) is one of the preferred fruit plants and has good prospects to be cultivated, salacca can produce fruit throughout the year. Salacca plants are classified as low palm trees that grow in clumps and have a shallow root system, the optimal temperature is 20-30o C, if less than 20 o C the flowering will be slow, if too high will cause fruit and seeds to rot [7].

Agricultural ecologist of Muria Kudus University, Hendy Hendro, supports the development of horticulture in the Mountain area. Mountain slope areas should be planted with strongly rooted plants, such as fruit trees, not fibrous-rooted plants which cannot absorb much water. That is why horticulture plants are also used in the revegetation of this degraded land.

Bamboo is one kind of grasses belonging to the Gramineae family and is a part of non-timber forest product commodities. [1], suggested that bamboo is a fast-growing plant and has a relatively short cycle of 3-4 years that can already be harvested. Bamboo plants are used in this revegetation because the ability to influence water retention in topsoils, which is able to increase underground water flow, is very real. Bamboo plants have very strong rhizome roots. This root structure makes bamboo can bind soil and water well. Compared to trees that only absorb 35-40% of rainwater, bamboo can absorb up to 90% of rainwater.

Animal feed forage is all forms of feed material derived from plants or grass including legumes that have not been cut or cut from the land in a fresh condition [4] derived from harvesting of vegetative parts of plants in the form of forage parts including leaves, stems, may also be slightly mixed with generative parts, mainly as a source of ruminant animal feed [5]. Live with clumps, has strong and deep roots so that it is able to bind the soil and hold rainwater in the soil so that it can prevent erosion.

The use of this plant functions as a binding plant element so that the quality of the soil can be restored as before. Therefore, this study will develop a model of synergy between soil and vegetation by examining the quality of the seed bag made. Some aspects of the novelty of this research are (1) the novelty of technology aspect in this study is the use of a seed bag. Repair of damaged soil structures due to disaster. (2) Socio-cultural aspects, that is changing cropping patterns and plant production closer to the natural ecosystem. Empowerment, direct and close involvement of the parties involved. (3) Food aspects can introduce, demonstrate and produce high-quality biological products.

This seed bag technology is expected to be able to make the process of revegetation instant because the growth of seeds or seedlings from the beginning has been conditioned in a nutrient bag so that it can quickly grow without experiencing disruption of the demolition, removal, or separation. Seed bags are able to hold soil bonds from scouring water, facilitate land rehabilitation, and protect other economic assets. Green economic mainstreaming occurs with the restoration of degraded land while at the same time producing fodder, tree crops, fruit, and other landscape functions.

Implementation Stage

Partnership with Practitioners. In this implementation, the research team will conduct a series of studies with roadmap guidelines that have been made, to improve the quality and level of application in the field, the researchers collaborate with partners engaged in revegetation to provide input and operational guidance on the critical land handling, CV. Plantamor Semarang.

Seed Bag Production Stage. This stage is conducted by mixing organic waste, organic compost waste, tree branches and supporting materials for making compost. This compost is then mixed with planting media so that it adds nutrients to the planting media. At this stage, bags from sacks burlap, bag or, plastic sack, PE plastic made, wherein the bag is cut according to need and then sewn to form.

Growth Sprouts Stage. After the bag is inserted with the seeds/seedlings, it is observed for its development. Germination is the process of growth and development of embryos in plants [6]. Germination is the beginning of embryo growth in seeds. Seeds that germinate can form plumules because they contain embryos. The embryo has 3 parts, namely the radicles (institutional roots), cotyledons (institutional leaves) and cauliculus (institutional stems). The process of seed germination is a complex series of morphological, physiological and biochemical changes. In this stage, germination trials, planting media trials, and trials of growing resistance from seeds that have been planted in the seed bag are done.

Seed Bag off planting stage. After the successful seed growth test, the seed bag is placed in the critical land of Ledek Mount, both on flat ground or unstable cliffs. By this, revegetation will be carried out and be able to restore the degraded land in which carrying capacity is dry.

Green Economics Evaluation and Orientation Stage. After the plants have successfully grown in the critical land of Ledek Mount, land revegetation occurs. In addition to improving land conditions, with the growth of seedlings used in this study also gives economic value to the community in the form of reinforcement and stabilization of slopes, landscapes, can produce animal feed, fruits, hardwoods, and protection of other economic assets, which is in accordance with the development of Green Economics.

Critical land needs to be revegetated to restore its carrying capacity, but direct planting on critical land is difficult to succeed because vegetation lacks nutrient intake, therefore we need planting media that is protected from abrasion or landslides, so it needs to be placed in a partial bag as a substitute for providing land massive on critical land.

These growing media bags can be made from burlap material or the like which contain planting media and are prepared for certain plant seeds that are ready to be planted, which are easily absorbed in the field, these bags are called "seed bags", some of the benefits expected with the use of seed bags are (1) Prevention of soil erosion caused by rainwater. Seed bags minimize the impact of falling rain, reducing surface velocity and drainage to prevent erosion and soil washing. (2) Provision of forage trees or ornamental plants (3) Planting with seed bags makes it easy for green plants. Vegetation planting will be successful if there is soil availability and seed compatibility with the planting media, planting can be arranged with a distance or position that is favorable for care. (4) Restoration of Natural Vegetation The presence of a seed bag makes it moist so that the germination of seeds is easier and makes the original vegetation around it can reappear. (5) Regreening on the surface of the embankment Seed bag can weaken the ripple of water in the river which tore the growth of grass, so that grass can grow on the surface of river embankments. (6) Promoting lichens and fungi. The presence of seed bags can bring moss and fungi in such a way that they grow which creates new ecosystems and support the growth of other vegetation. (7) Blocking gusts that damage crops. Besides strong gravitational seed bags, plants with roots in the seed bag are able to withstand strong gusts of wind especially for coastal areas so that they can continue to live.

IV. Conclusions

The production of Seed Bags as an effort to develop critical land conservation technology that can provide disaster preparedness at the local scale of settlements or campus areas, support green open space (RTH) and rehabilitate degraded lands affected by floods/landslides and making them more productive and useful, support the campus landscape and conserve technical revegetation and land rehabilitation, turn arid landscapes into green, help campus communities manage organic waste and provide examples of real Green economic practices to the campus and the public while producing forage for food, horticulture, and fruit.

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