F.I.T.E BUSINESS SOLUTIONS COMPETITION

Charcoal Briquettes from Coffee Grounds: An Ecological Solution in Coffee Agritourism

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ABOUT THE BUSINESS PRACTICE

Photo: farmer and coffee field

Indonesia is known as one of the world's largest coffee producing country, so the coffee agro-tourism could be an alternative tourism destination potential to be developed (National Geographic Indonesia, 2015). Indonesia produces at least 748 thousand tons or 6.6% of world coffee production (Industrial Minister, 2012). Civet (locally termed as “Luwak”) coffee agriculture, as practiced and well-known in Indonesia, should also have sustainable development principles suggested by the United Nations (2002). Today, with a population of 255 million, Indonesia is in the level of consumption of 4-5 million bags per year, or about 300,000 tons (Data, 2016). Coffee consumption level of Indonesian society has grown by about 5-6% per year. With this fact in mind, there are opportunities to create new products from the coffee drinking waste, as there are great amount of generated coffee ground. According to a study, coffee grounds can be used as fuel in the form of charcoal, then into briquettes (Bruins, 2013). Compared to ordinary wood charcoal, coffee charcoal coffee has distinct advantages in terms of environment and health. With the benefit of coffee charcoal produced from waste coffee grounds in agro-tourism, the coffee grounds which is initially seen as an useless waste can be a solution to an environmental challenge from coffee production and agro-tourism, that gives benefit to the community. For this reason, I propose the charcoal briquettes made from coffee grounds as a business solution in coffee agro-tourism.

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CURRENT ENVIRONMENTAL CHALLENGE

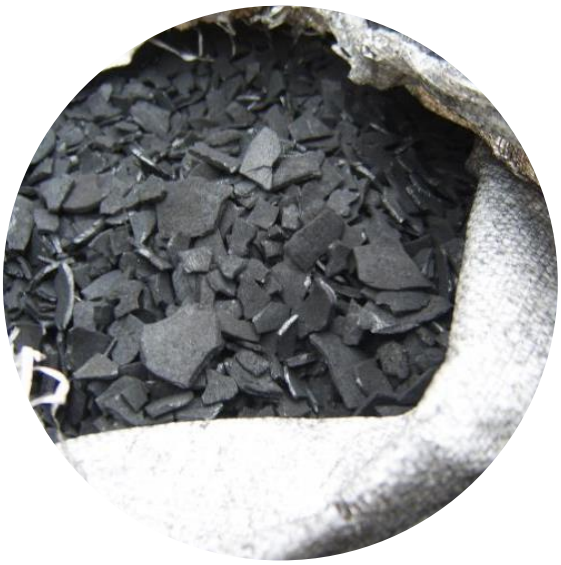

Photo: wood charcoals

Coffee waste contains some toxic chemicals like alkaloids, tannins and polyphenolics. This make the environment has biological degradation of organic material (Recyclearearea, 2013). The environmental impact of coffee waste is organic pollution, the most is effluent waters where coffee is issued. This condition can be fatal to creatures in the water and can cause odor, bacteria that can cause health problems can seep into drinking water sources.

Meanwhile, the public as well as agro-tourism have used charcoal to roast coffee and to cook for the food, and they do not notice the negative effect produced by the ordinary charcoal. From the environmental aspect, the ordinary charcoal is charcoal made from wood harvested so as to destroy forests and reduce the number of trees. Besides the combustion process is not well can cause air pollution from smoke generated. Wood charcoal also has the disadvantage that is easy to ash so it requires high supply of charcoal for burning. From the health aspect, the timber contains activated carbon charcoal and petrochemical additives that are harmful to the body. Aroma generated can alter the taste of food being burned.

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SOLUTION OFFERED

Photo: processing the briquettes

The problems arising from wood charcoal and stoves in processing coffee and food in agro-tourism coffee, then the best solution is to process the coffee grounds into briquettes coffee grounds to replace ordinary charcoal. Charcoal briquettes from coffee grounds can last for an hour in the open under normal weather conditions, and have a burning time of non-stop 2 to 3 hours. It is safer to use charcoal briquettes for grilling food because it does not contain petrochemical additives and can improve cooking. The briquettes do not share the smell of the coffee and neither smoke excessively compared to wood charcoal so it will not leave the coffee aroma in any baked goods. Importantly, charcoal made from the coffee grounds is included in the category of biomass refers to biological material (Vandro, 2016).

The process of making charcoal briquettes is that the coffee grounds are collected in advance and are separated according to the type and quality of coffee grounds. Then the drying should be done so perfectly to make them have a longer shelf life. Smooth pulp quality is needed to facilitate the gluing using tapioca starch, thereby reducing firmness and density pressure of the charcoal produced (Boejang, 1973). Good adhesion process is determined by mixing the adhesive material that is affected by the operation mixer, the proper adhesive composition and size of the mixing. Every

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1 kg of powder mixed with an adhesive material consisting of 30 grams of starch (3% of the weight of powder materials) and 1 liter of water (Boejang, 1973). The powder mixed with tapioca flour in the machine, then the oven. Pyrolysis for charcoal formation occurs at temperatures between 150 ° C -3000 ° C. Storage areas must be maintained properly so that the bacteria is not easy to breed.

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COST AND BARRIERS

Photo: coffee ground briquettes

It is inexpensive to make charcoal briquettes from coffee grounds because the material has been provided spontaneously from the waste of coffee drinks in agro-tourism. It only needs to add tapioca flour and in the right quantities with the right temperature. To achieve a perfect result, the required accuracy and rigorous process for selecting the quality of coffee grounds, the appropriate dose and good processing equipment. The process is dissimilar from making the wood charcoal that only a burned, but efforts are required in sifting, mixing the batter, and up printing and pressing. If the resources both human and machine are insufficient in number, it can slow down the process since the coffee ground consists of natural ingredients that are easily damaged.

Good processing standard is required for both of staff and the machines. The standard can be obtained from studies and tests conducted by specialized laboratory. The studies result the proper procedures, which can be used as references in making the coffee grounds into charcoal briquettes, ready for production and consumption. With the process is quite complicated and strict, then someone or company would be reluctant to process the coffee grounds into charcoal than to use wood charcoal and readily available on the market with an affordable price. Consequently, the next obstacle is how to overcome the reluctance of the human resources to treat waste generated from coffee civet agro. To overcome the reluctance, they can be shown the process and the finished result

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of coffee charcoal that has been successful and qualified to give them a picture or a comparative study that coffee grounds can be recycled as charcoal briquettes that are more environmentally friendly. They are also motivated that by making charcoal coffee and using it, they can save the earth from pollution and waste coffee grounds.

Picture by https://images.google.com/

COFFEE GROUNDS BRIQUETTES IS THE BEST OPTION

Photo: using coffee ground briquettes as a fuel

Considering the benefits and advantages resulting from charcoal / briquette coffee grounds, then its use is highly recommended, both in agro-tourism and consumption by the public. If not using charcoal, people usually cook or roast using the stove, and they need electricity, gas or kerosene. However, gas and kerosene are considered as on-renewable energies and contain hazardous chemicals. In addition, using modern stoves also decrease the impression of organic agro-tourism. The cost of purchasing liquefied petroleum gas (LPG), kerosene and wood charcoal are also likely to be greater than using naturally generated charcoal made from the coffee grounds as the daily waste in the coffee agro-tourism. By using coffee grounds charcoal in coffee roasting, the use wood charcoal can be minimized, as it is dangerous and can cause pollution and environmental degradation from harvested timber.

Training is required for employees about the making of charcoal briquettes from coffee grounds. Indirectly, this process can provide insight to the community, the tourists, to the wider society, as well as to motivate the employees to give the customer with their best services. As mentioned, this product is the best ecological solution that can be adopted by the civet coffee agro-ecotourism practices to minimize their coffee waste. People can do something useful from coffee

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grounds because if they are thrown away and left to dry can then be dust and cause air pollution that can trigger respiratory disease and allergy for humans and shortness of breath because they contain chemical compounds such as polyphenolics. For the above reasons, it would be much better if the coffee grounds can be recycled and used as a superior and renewable biomass.

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