



TRAINING REPORT ON THE PRODUCTION OF FUEL BRIQUETTES

A Youth Training aimed on reducing the pressure of deforestation and promoting

ClimateActionPreneurship for Youth of Ghana to drive Climate Action

Ghana, 2020

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Training Participants: Deladem, James, Selorm, Wisdom, Edem.

Introduction

Ghana is among countries that have ratified the Paris Climate Change agreement turning their determination to act against climate change into globally accountable commitments. Through these commitments, Ghana hopes to reduce its emissions by 15 – 45% by 2030. This is to be achieved simultaneously with key socioeconomic development priorities of food security, creation of income, job & enterprise opportunities for youth and the entire population, and expansion of macroeconomic growth as stipulated in Ghana's long-term development vision.

Among key areas needing action is in forestry. Ghana is recorded as having one of the highest deforestation rates in Africa and under business as usual trends, emissions will increase by 1.4% annually. Because of deforestation, the country loses over \$130 million every year due to degraded ecosystems. Harvesting natural forests for charcoal production is one of the key drivers of this degradation, where up to 80% in rural areas and 50% in urban areas depend on charcoal as the primary source of fuel and also provides the major alternative source of income for farming communities. Up to 90% of wood used in charcoal production is obtained from natural forests. In addition to environmental impacts, the health impacts of indoor pollution from unclean cooking are impossible to ignore. This pollution causes Ghana 18,000 premature deaths each year. Women and children are most affected with up to 2,200 children dying each year.

In response, Ghana's NDCs set forth ambitious commitments in reversing forest degradation and indoor pollution resulting from charcoal and firewood use. The country aims to expand access and adoption of efficient cookstoves to 2 million efficient cook stoves by 2030. Analytical modelling done through the UNEP-EU Africa Low Emissions development (LEDS) Project on the impact of this policy move, projects that combining plantation forests with clean cookstoves would sequester 85% more carbon for Ghana – which is much higher than the set target of 45%. On the economic front, this combination would generate over 6 million direct jobs and cumulative revenues of over \$130 million up to 2030. On the social front, the adoption of clean cookstoves and its reduction of indoor pollution was projected to reduce deaths by over 1,400 per year by 2030.

While the primary responsibility of government is establishing enabling policy, it is the role of non-state actors, including individual citizens to invest in operational level solutions that unlock benefit of such policy provisions. In Ghana, as is the case in most African countries, the youth constitute the most significant non-state actor constituency by virtue of their numbers.

Across Africa, through a UNEP- Ecosystem based Adaptation for Food Security Assembly (EBAFOSA)-led approach called Innovative Volunteerism, youth are being guided to improve,

refine, and adapt their skills and ongoing enterprise actions to work selflessly with communities in delivering solutions to environmental & developmental challenges but through the lens of climate actions and in an enterprise approach. What are called climate action enterprises. Among the primary criteria for solutions is the need to ensure they are non-capital intensive and can be modelled into marketable solutions. To this end, waste recovery to domestic energy is a leading climate action enterprise area youth are engaging in.

It is by this fact that this training was undertaken, to empower the youth to make fuel briquettes from organic waste materials like straw, cassava peels, saw dust, orange peels, etc.

Objectives

At the end of training participants should be able to:

- Understand the concept of making briquettes and be able to make some.
- Make briquettes from sample waste materials.
- Understand the concept of how various biomass work and to be able to make better briquettes.

Orientation and Theory of briquette production.

This involved moving around the production area, showing different methods of production, modes of drying and raw materials that can be used.

The team appreciated the general concept of production and the methods of production taking into consideration starting.

Theory of briquette making

A session on the theory of briquette making was also done. At this point, different aspects like ratios in making briquettes, the factors that influence briquette quality, general market ecosystem of briquettes, the most appropriate raw materials and threats.



Team EBAPreneur Solutions, Ghana and Trainer Simeon Akikayo, Nigeria.

The day started off with an introduction which was done by the director and founder of EbaPreneur Solutions Ghana, Deladem.

He gave a brief purpose for gathering (training of the team) on **making fuel briquettes**

Simeon, the trainer then took over with a brief introduction and then started off by explaining what briquettes are, the kinds of briquettes types that can be made from various biomasses with special emphasis on cassava peelings as the main raw material and the various binders that can be used as well.

He also spoke on the materials that can be sourced locally in making the dryers, the two(2) basic types, which are the conventional and non-conventional.

He mentioned cassava, potato, yam, orange peels, saw dust, dried plantain debris, straw etc as part of the feedstock that can be used in the making of the briquettes.

Day 2

The previous day's exercise set the pace for the day's activities in motion with participants showing a lot of energy and enthusiasm for the training.

Having gone through the gathering raw materials and dried them, all was set to begin. The raw materials consisted of cassava peels, wood sawdust, straws and corn husks.

A metallic drum was used as the burning furnace with 3 blocks supporting the base where the fire gets lighted/started.



As shown in the picture above, is where the char from the biomass material is carbonized and grinded to the point where it is smooth to mix evenly with the binder(cassava starch). At this point the mixture is then formed into whatever shape we desire finally.

Day 3

At this point, the team had successfully been able to go through the process of making their first ever briquette.



Day 4

Training Gaps

- One of the major training gaps was not having the cassava peels dried below the maximum moisture content to enable proper burning to get the char.
- Not having the char as smooth as we would like to avoid briquettes becoming smoky and brittle. This was because we used a manual process.
- Lack of a compressing/compacting machine to make briquette more smoother.

Training Remedies

- Maximum drying of feedstock to remove moisture content below even 0%, this will allow for proper and full combustion of biomass.
- Having a smoothed char reduces smoking to the minimum level.
- Getting a bigger biomass carbonizer will reduce the number of times we would have to burn materials. This will even be more user-friendly as well as carbonizing large amounts of waste at once.

Day 5: Testing the briquettes made



The finished briquettes showed good flaming ability and also non-brittleness. The briquettes made were tested by the trainer and we saw relatively good flammability and good burning efficiency. This was evident that we were able to make good briquettes on trials. As time goes by this will be perfected following more acting and reading about briquette efficiency across different parameters especially types of biomass used.

Conclusion

- Through Innovative Volunteerism, together with my fellow Innovative Volunteerism actors in Ghana, we have retooled our diverse skills, and aligned them to create an enterprise approach in solving climate challenges.
- By having the skill set to make briquettes we have the right skill set to go on and provide an alternative and sustainable fuel for usage in cooking stoves.
- This will also respond to Ghana's policies – specially contributing to the implementation of Ghana's commitment to combat global climate change – popularly known as Ghana Nationally Determined Contributions(NDCs).
- The youth contribute the biggest non-state actors which when utilised and supported, will contribute an enormous amount of solutions towards climate change even more from an enterprise perspective which will create more jobs for the youth.

Next Step:

The common vision shared by all the participants in this training is to be equipped, to learn how to make fuel briquettes and in addition to previous skills to be able to produce and market it in order to gradually replace charcoal and firewood. In the perspective of this shared vision we hope to expand our work into climate action enterprise which creates incomes, participates in the resolution of deforestation, indoor pollution and other environmental and socioeconomic problems in Ghana. By this, we will contribute to not only implementing Ghana's NDCs but also participate in the creation of employment, wealth and the improvement of living conditions and the fight against poverty for the youth and the entire communities.

For this fact it is important to produce enough fuel briquettes and at an affordable cost to reduce the needs in charcoal of the populations. This will help to drive the implementation of Ghana's Nationally determined contributions (NDCs) which focuses on clean energy.

We will now embark on expanding this fuel briquettes production and decentralize this to households to replace the dependence on wood biomass across Ghana. We will now start mapping out households, eateries, and other charcoal demand centres where we will start delivering our solution. This mapping exercise will be expanded to additional neighbourhoods – households and eateries - in the city and across the country. We will also map supply chains of raw material for making briquettes. This mapping will be continuous process.

We will also look towards making bio-fertilizers to help farmers replace chemical fertilizers with organic fertilizers. This biofertilizer will be used together with the ash from briquettes to improve soil structure and water retention capacity.

We will map both supply chains of raw material and demand markets for biofertilizer. This mapping will be continuous process.

We will also expand on the clean cooking value chain by venturing into clean cook stoves production. This will create further demand for the produced fuel briquettes as households can leverage these clean cookstoves to not only ensure efficiency in cooking but further reduce the indoor pollution which helps ensure achievement of other social aspects as health and cost savings which is an economic opportunity