Green energy kitchen for low-carbon community and non-toxic food

Technology transfer team members (coordinator)

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Thailand is an agricultural country where more than 50% of Thais are incorporated in agricultural occupations. Apart from the primary agricultural products, there is also an abundance of agricultural by-products or wastes, so-called "Biomass". Sources of biomass are predominantly from rice straw, grass, bagasse, corn, palm, and twigs. These feedstocks are useful natural sources of fuel to produce bioenergy. However, most of them were usually neglected and discarded by farmers without knowing their potential value. To be highlighted, this biomass can implement a transformation to produce a "syngas" instead of using an LPG (liquefied petroleum gas) or even the "biochar", which is a black stable solid that can increase soil fertility and agricultural productivity.

Nowadays, the worldwide energy crisis, climate changes, and food security issues have reignited demands for more energy production, posing a threat to the world's climate ambition. Also, due to the urban sprawl, trees are being cut and destroyed for industrial and urban use, thus directly reducing the CO_2 absorption capacity and causing many consequences. Accordingly, these issues are an urgent call for action by countries in a global partnership aiming for Sustainable Development Goals (SDGs). For Thailand, renewable energy (or green energy) has been raised as a primary concern in the National Economic and Social Development Plan. To this end, we envision that transferring knowledge to the locals and emphasizing the importance of biomass conversion can significantly impact society in several aspects. Herein, by

simply converting agricultural waste to biomass energy and biochar is expected to make three key benefits, including (i) improving soil fertility by biochar, (ii) reducing the climate impacts by replacing the common greenhouse gasses (GHGs), and (iii) reducing poverty through reducing the household expenditures on energy. Furthermore, the realization of this renewable energy is believed to be helpful for practical application, thus making it a broadly utilized form of energy concerning the green energy kitchen for low-carbon community and non-toxic food.

In this program, Assist. Prof. Dr. Sarintip Sooksai from The Institute of Biotechnology and Genetic Engineering, Chulalongkorn University, together with BEBC En SAFE Life foundation, is taking part in the technological transfer on the biochar production for soil fertilization in the theme " low-carbon community, non-toxic food, and sustainable wealth", which was initially held on September 2021. The primary target audiences (including farmers, community leaders, and members of the learning center) can be categorized into five groups (with five members in each group) and listed as follows:

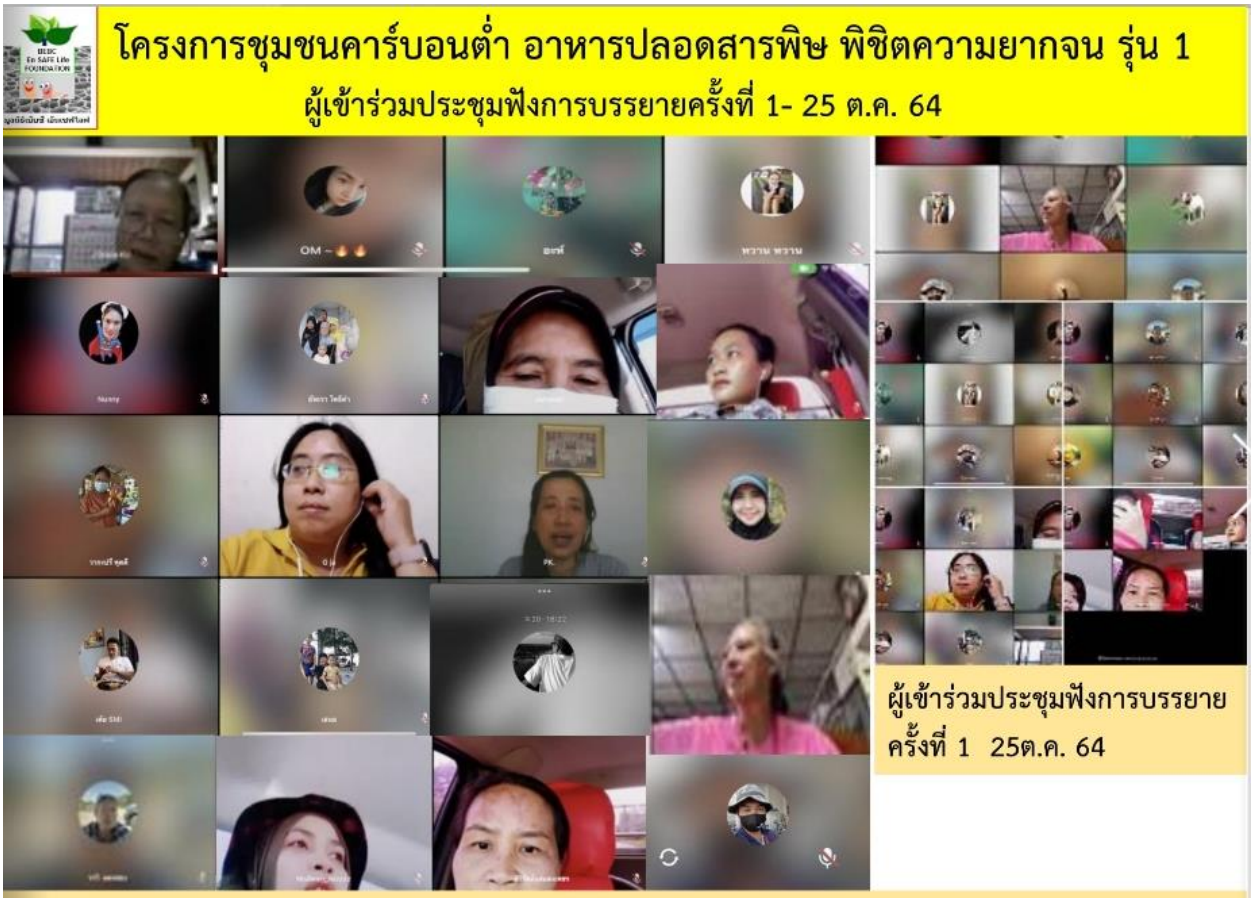
- Farming households from Thung Khru, Bangkok
- Konglakuentin company learning center from Khlong Sam Wa, Bangkok
- Kaset Nontri 1 & 2 learning center from Amphoe Lam Luk Ka, Pathumthani Province
- Farming households from Phichit province and Phitsanulok province

The key objectives for this program are (i) to create long-term sustainable wealth, (ii) to develop a sufficient economy through philosophical guidelines, (iii) to help reduce global warming issues as well as climate impacts from the use of GHGs, (iv) to reduce waste to a minimum and create added value through a circular economy, (v) to encourage the community to extend the use of biomass energy rather than LPG, (vi) to transform carbon wastes into biochar for soil fertilization, and (vii) to reduce the use of chemicals and pesticides in agricultural products.

During this pandemic of COVID-19, the program was performed through online meeting platforms (both theory and practical sessions). Also, the foundation supported by Mr. Bunpot Suksawang has donated a BEBC stove to the program participants. Overall operation reports and related information can be found at https://online.anyflip.com/yhjug/arrd/mobile/index.html for those who might be interested.

Activity

Theory sessions held on October 25th, 2021 (the first round) and November 10th, 2021 (the second round)



Theory sessions held on November 11th, 21st, 30th of 2021, December 25-25th of 2021, and January 5th, 2022.

Reference

[1] อรสา สุกสว่าง. ระบบพลวัตทางภูมิศาสตร์. พิมพ์ครั้งที่ 13 กรุงเทพฯ : โรงพิมพ์สำนักส่งเสริมและฝึกอบรม มหาวิทยาลัยเกษตรศาสตร์; 2561.