

## Factsheet final findings Applied Research Fund Call 3



### Scaling-up “Biochar-Urine Nutrient Cycling for Health” in Bangladesh (BUNCH2Scale)

#### Summary

In Bangladesh, diets are often deficient in vitamins and minerals. Homestead gardening can provide a source of fresh fruit and vegetables to enrich diets, but soil fertility is often low and commercial mineral fertilizers are expensive and difficult to dose. Biochar, made with crop waste in soil-pit kilns, is a porous material that transforms urine, an efficient but underutilized fertilizer, into an odourless solid fertilizer. Scaling-Up “Biochar-Urine Nutrient Cycling for Health” in Bangladesh (BUNCH2Scale) sought to examine the efficacy of this technology in north-eastern Bangladesh.

BUNCH2Scale worked with farmers to scale up biochar-based organic fertilizer production to 48 settlements. Collaborating with local NGO field workers and research institutions, BUNCH2Scale evaluated the potential of this novel method for increasing garden production through farmer field trials – comparing the new method alongside traditional methods in each farmer’s field. It was found that biochar-based fertilizer improved crop yields and was well accepted by farmers. Farmer workshops indicated that the participatory trainings empowered women by giving them more freedom and a higher status due to acquired technical expertise and successful gardening. The project has finalised, but dissemination activities are continuing, including launching a manual with which the benefits of this novel technology can be spread to farmers across Bangladesh.

#### Final research findings

Producing biochar-based fertilizer on small farms was easy to learn. By the end of the training and active support by the project (early 2018), 79% of the targeted population reported that they were confident in producing biochar on their own. Of the targeted population, 72% reported that they are planning to continue producing biochar. These farmers also reported that using a biochar-based fertilizer resulted in agricultural gains such as higher yields (95%), healthier plants (92%), and fewer pests (65%), as well as better tasting crops (55%), while being free (55%) or at low cost (49%).

Yield benefits were large and consistent across crop types and production methods. Farmer trials in sack gardens during the hot-dry season indicated an increase in weight of harvested vegetables from 78% to 133% for ash gourd, 34% to 118% for bitter melon, and 16% to 81% for pumpkin due to biochar-based fertilization. In the winter season, biochar-based fertilization was tested for nine crops in garden beds. Yield benefits ranged from a 25% increase for carrot to 88% for radish.

#### Final outcomes achieved

BUNCH2Scale trained over one thousand farmers on the production and use of biochar-based fertilizers. Due to the farmer field trials, farmers saw the yield benefits in their own fields. In the year following the conclusion of the active support portion of BUNCH2Scale, 61% of farmers continued to use biochar-based fertilization to fertilize at least some of their fruit and/or vegetable crops, while 56% of farmers reported that biochar-based fertilizers were their most used fertilization system in at least one season.

At a participatory workshop held in late 2018, lead farmers spoke of the project outcomes and how it had turned sceptics into believers. When they started to receive training on cultivation and biochar, they reported that neighbours teased them saying: “Is it worth to learn about cultivation and making fertilizer? We are able to cultivate already without learning from others, don’t we?”.

However, after these neighbours saw that biochar-based fertilizer users were producing a lot of vegetables from small plots without resorting to chemical fertilizers and pesticides, many neighbours began buying vegetables from farmers using biochar and asked to be taught these techniques.

#### Project messages to

##### A) Actors from private sector:

- Input sellers can incorporate biochar into their messaging as biochar can improve the efficacy of commercial fertilizers. Similarly, seed sellers can point to the benefits of production using both quality seed and biochar-based fertilizers to improve crop yields, particularly when paired with quality seeds.
- Commercial horticulture producers can and have taken up this technology to increase yields.

##### B) Civil society and practitioners' organizations:

- Helen Keller International has used this technology in other existing programs based on biochar-based fertilizers ability to improve crop yields at low cost, as these fertilizers are also easy to make and are well accepted in Bangladesh. The project team continues to reach out to other NGOs in Bangladesh and elsewhere to further scale the technology.

##### C) Policy makers:

- Biochar-based fertilizers are a promising tool to add to the trainings provided by extension services. Such trainings have been provided in the local area of the project.

#### Knowledge products

*The project is finalizing its knowledge products. In the coming months, products that can be expected are:*

- A biochar-based fertilizer production manual, for use by civil society and government extension services in Bangladesh.
- An academic article summarizing the results and sustainability of BUNCH2Scale.

#### Knowledge networks

This project is linked to civil society in Bangladesh through the Nutrition Working Group – Bangladesh. The project participated in several civil society meetings on biochar during the project period. The FAARM project is working in collaboration with the Bangladesh Agricultural Research Institute (BARI), and this collaboration has resulted in further spread of the biochar technology. Once project dissemination is completed, BARI will be a partner in these activities along with the Department of Agricultural Extension.

#### Knowledge co-creation

BUNCH2Scale had a substantial scope for co-creation since the focus of the four partner organizations were all at different places in the spectrum between farmer innovation to farmer teaching, allowing for considerable co-learning. Field implementation was led by two organizations with extensive experience working with poor rural communities in Bangladesh, Hellen Kellen International (HKI) Bangladesh and the local NGO Voluntary Association for Rural Development (VARD). Researchers from the Heidelberg Institute of Global Health supported HKI in documenting the crop diversity of the area and more accurately measuring yields. Ithaka Institute for Carbon Strategies, with extensive experience in implementing and adapting biochar-based organic fertilization, led the farmer-led field trials. Support in development communication from Centre for International Cooperation of the Vrije Universiteit (CIS-VU) enabled the project to learn-back from project participants in a systematic way – something that has been a limitation in earlier HKI projects. This was done through feedback from the “living lab” workshops, in which VU identified ways in which diffusion of bio-char and other techniques can be better disseminated. Collaboration was facilitated through joint field visits in each year of the project as well as routine coordination meetings, informal phone calls, and feedback provided on reports and other project outputs.

#### Consortium Partners

- [Helen Keller International](#)
- [Centre for International Cooperation, Vrije Universiteit](#)
- [Institute of Public Health, Heidelberg University](#)
- [Ithaka Institute for Carbon Strategies](#)

#### Contact person

Jillian L. Waid  
[Jillian.Waid@pik-potsdam.de](mailto:Jillian.Waid@pik-potsdam.de)

#### Project website

[F&BKP Research Project page](#)