

How we work

The Biochar Fund eradicates hunger, deforestation, energy insecurity and tackles climate change by connecting markets and the cooperative efforts of our farmers. It is important to understand that the problems described are deeply intertwined. Only by tackling their root causes in a systematic and integrated way is it possible to solve them. We do this by generating a unique synergy that interacts with all aspects of the different problems and that is managed by the communities themselves.

To achieve this synergy, we use a phased approach. All elements of the Biochar Fund's intervention are profitable in themselves. But by combining them, our farming communities gain enough financial leverage to fully own and manage each component of the system. Once the synergy is achieved, communities become resilient and capable of meeting all basic needs required to end poverty in a structural way.

1. Ending hunger: input markets, knowledge and output markets In a first phase, we make it possible for even the tiniest and poorest of farmers - who are women - to participate in highly profitable agriculture. Counter-intuitive as it may seem, the key to do so is to make agriculture far more sustainable. We create a "market bundle" that contains all the pieces our farmers need to plant, grow, and sell new crops that multiply the value of their harvest. By linking our farmers with markets, we help them to create a permanent solution to the hunger problem.

- The first component of the market bundle is to organise local groups of farmers. We organise women into cooperative self-help groups. These groups "pre-organize" a member base for us. Together, we recruit, screen, and sub-divide farmers into stable, sub-groups. Bringing farmers together makes it possible for them to reach enough scale to economically interact with markets.

- The second piece of the market bundle is basic farm education, provided by a field officer. We bring the advice of professional agronomists to the field. This education includes basic knowledge about crops, soils, pests, diseases and fertilizers. Over time, our women's groups learn to grow higher-value crops that have ten times the profit potential of their current crops. The knowledge we plant with them means a permanent, lasting solution to hunger.

- The third piece of the market bundle is capital, environmentally-sensitive planting materials and fertilizer. Our planting materials are a significant improvement on old food kernels currently used for seed – commercial seed is professionally graded, stored, and selected. Our fertilizer provides badly-needed nutrients to the acidic, nutrient poor soils that result from slash-and-burn. The fertilizers are also used to reclaim soil and degraded land that has been stripped bare over decades of poor management. Together with education, these basic farm inputs have the potential to unlock the true potential of a farmer's field. The biochar component immediately consolidates the gains, as it stabilizes soils and makes fertilizer applications worthwhile.

- Lastly, we connect our farmers with output markets. Currently, the women we work with are unable to grow, let alone sell any crop surplus, making it impossible for them to get cash for their crops. One sub-group of women, cooperatively organised, is trained to act as a bulk-selling agent, allowing their colleagues to access prices that are often 2-3 times what they could get otherwise. This cash creates a savings-and-investment cycle that leads to self-driven, permanent growth out of hunger. Part of the savings are invested in other components of the biochar system.

The Biochar Fund's investments are paid back by the farmers groups only after they have achieved a robust increase in outputs. Contrary to micro-finance organisations, we do not work with "loans" per se, but rather with a barter system because this is preferred by the farmers. The Fund operates its own bulk selling agency that sells part of the surplus generated by our farmers; these sales finance our operations as far as the first phase is concerned. The agency only sells a surplus that was agreed upon in advance with the women's own sales group.

This system is possible because the gains are so great. Our trials show that, merely because of the implementation of this first phase, crop yields can be tripled to quadrupled after only two growing seasons. Value generated by our farmers can be increased ten-fold in a later phase.

Part of the savings that emerge amongst our farmers is used to invest in the next phase of the synergy.

2. Consolidating the gains: biochar and carbon markets

The investments made in the first phase are sufficient to eradicate hunger temporarily. However, these gains need to be consolidated because our farmers still face many environmental and weather related threats. The key to consolidate the gains in a structural manner is to invest in integrated soil management techniques based on biochar.

Our farmers used to abandon their farm land after only a few years to slash-and-burn for more land, because the problem soils they cultivate get depleted very rapidly. Adding fertilizers to these soils is only a first fix to boost output. However, these relatively costly inputs get lost rapidly too, unless they are applied to biochar amended soils.

- The first element of the "biochar bundle" is basic education in integrated soil management. Our field officer teaches the techniques to produce biochar and how to apply it to soils. When optimally managed, biochar reduces fertilizer requirements. So now our farmer groups learn how to minimize fertilizer input and maximize crop output based on the interaction of biochar and nutrients. The same amount of food can be produced as in the first phase, but with less fertilizers. Decreased fertilizer use means lower costs to our farmers.

- The second piece of the biochar bundle consists of connecting farmers to carbon markets. Biochar stored in soils forms a stable and permanent carbon sink for which carbon credits are available. Additionally, deforestation is avoided in a serious manner, an achievement for which again funds are available. Initially we manage the connection between the carbon sink/avoided deforestation and the carbon market, but simultaneously we teach our farmers the workings of (voluntary) carbon markets and offer them the knowledge and tools to attract these funds themselves.

The biochar intervention opens very important routes into sustainability: soils remain productive and make continued investments in modern inputs feasible. Biochar makes sure the same crop production level as that achieved in the first phase can be maintained, whereas carbon credits offer an important and additional source of income to our farmers groups.

Once stable, fertile soils have been created and the farmers know how to manage nutrients in an optimal manner, they are encouraged to grow more lucrative crops.

As in the first phase, part of the savings obtained from continued high food sales and carbon credits, is used to invest in the third and final intervention.

3. Investing in renewable energy

Once our farmers are connected to food and carbon markets, they are incentivised to keep the carbon sink and food production level as high as possible. They have also acquired the financial means and the skills to do so. Their tripled (or even quadrupled) food output means a large amount of locally grown residual biomass becomes available: stalks, leaves, hulls, cobs, twigs, and so on. Traditionally, this resource is burned in the open air (releasing emissions), but it can be turned into biochar the traditional way. However, the most efficient way to use these field residues is to turn them into biochar using a modern pyrolysis technology that yields renewable energy at the same time.

This technology consists of small scale pyrolysis plants that generate biochar and electricity from syngas in an optimal way. Our farmers use the savings obtained from selling surplus food and from carbon credits to invest in the acquisition of such a micro-pyrolysis plant.

- The first action in the "energy bundle" consists of training an energy manager to operate the pyrolysis plant and to produce electricity and biochar for the community in the most optimal mix.

- The energy manager cooperates with the carbon market manager in such a way that market opportunities are exploited in the most profitable way.

- A very basic, village-scale electricity grid is created, managed and maintained by the community.

Thus the third phase of the Biochar Fund's interventions closes the cycle: improved food output yields more biomass, which is turned into energy and more biochar through an efficient technology; the biochar is returned to the farmers' soils, which are kept fertile, allowing for continued highly productive agriculture.

The electricity from the village-scale pyrolysis plant helps solve one of the world's most pressing problems: providing modern energy services to rural communities. The bioenergy in question is carbon-negative, renewable, clean and very low-cost.

Access to electricity ends the reliance on inefficiently used wood fuels and helps solve the problem of indoor smoke pollution, a true "killer in the kitchen" mostly affecting women and children. A sustainable and locally managed supply of electricity provides the power to make agriculture and food processing more efficient; it lays the ground work for basic health care, education and many more modern social services.

4. Resilient communities: the synergy

Through these relatively simple interventions, the world's poorest and most fragile communities can achieve major social, environmental and economic gains. A traditional, unsustainable and socially catastrophic land use cycle is transformed into a highly productive and sustainable cycle that tackles some of the most difficult problems in the developing world.

Our farmers become resilient communities who own all the means of production and succeed in meeting their most basic needs. They acquire access to abundant food, engage in income-generating agriculture, learn to manage their natural resources in a smart way and they gain access to modern energy services. They do all this while making a profit.

The cycle of savings ultimately leads to a situation in which our rural women can feed their children, have them educated and obtain the means by which they can enjoy basic health care services. It is these indirect results that further reinforce and consolidate the gains made by the implementation of the Biochar Fund's intervention.