

Project „Cocoa for Energy“

Project Description:

The Ivory Coast and Ghana produce about 2.3 million tons of cocoa per year. This is more than half of the world's production. Especially to produce chocolate, the extraction of cocoa results in a large number of cocoa shells, which until now have been left as a waste product. Cocoa shells left at the plantation can even pose a problem for the environment by causing difficulties in soil irrigation. In traditional cocoa harvesting, the cocoa beans are removed from their shells while still at the plantation, and the shells fall to the ground and remain there. As a result, water cannot get into the soil easily and the soil becomes compacted.

How can this problem be solved?

You can upcycle the cocoa shells and make another useful product from the waste product.

Namely, vegetable charcoal.

So, by reusing a waste product, you can create jobs, protect the soil from becoming clogged, and get a new product: Vegetable charcoal.

In order to create prospects for the rural population in San Pedro, Ivory Coast, cocoa shells are to be converted into fuel, energy, and biochar. This process not only actively contributes to climate protection, but also brings great benefits to the population, since cooking in the Ivory Coast is mainly done with charcoal, which is currently extracted from the surrounding vegetation and is time intensive. To avoid this, the use of cocoa shells as available residual biomass is a good solution.

How does it all work?

To produce charcoal from cocoa shells, pyrolysis furnaces that are easy to build, operate and maintain are developed. These furnaces are made locally by us in the Ivory Coast. For example, two oil drums reclaimed from existing building material can be placed inside each other to construct a furnace to produce coal. The inner chamber is filled to the brim with cocoa shells and closed airtight. The material is set on fire and pyrolyzed. In about 15 minutes, the cocoa shells lose about half their volume. What remains is the charcoal, which can be easily stored and sold. During the pyrolysis process, the energy generated can also be used for cooking.

If one so desires, the plant carbon can also be used for other sustainable projects.

Vegetable carbon can be used, for example, as a feed additive for cattle. This can reduce environmentally harmful methane emissions from cattle farming by up to 40%.

Vegetable charcoal can also be used as a slurry litter in stables to reduce the formation of ammonia. Another possible application is the use of plant carbon as fertilizer, which not only provides plants with nutrients, but also serves as an efficient water reservoir. By producing plant carbon from cocoa shell, the ecosystem can be significantly improved, and the principle of the so-called circular economy is achieved. Furthermore, in addition to the ecological benefits this holds potential to stimulate new areas of business and create new job opportunities.

For this project, local farmers work together. At the start of the initiative, the project and the implementation plan are presented in a workshop: Cocoa shells are heated without oxygen supply. Pyrolyzing the shells produces combustible wood gas for electricity generation, thermal energy, and valuable vegetable carbon. The production of vegetable carbon from cocoa shells provides farmers with additional income. In addition, the vegetable carbon improves the soil of the cocoa plantations, which at the same time reduces the cost of fertilizer that farmers must spend year after year. This project, can thus, make the rural population more independent from fluctuating cocoa prices by providing additional income.