

COFFEEBRIDGE

Bridging knowledge to the field: an evaluation of the agronomic and socio-economic potential of Robusta coffee genetic resources as a cash crop in the Congo Basin

DURATION
15/12/2019 - 15/03/2024

BUDGET
958 725 €

PROJECT DESCRIPTION

Coffee is an important cash crop for coffee farmers in the Global South and is an important commodity worldwide. In this project expertise from different disciplines are integrated, knowledge is valorized and science-based advice is provided for the revival of sustainable Robusta coffee production in Tshopo Province (DR Congo), for the conservation of the genetic diversity of Robusta and for the development of a local, sustainable economy. We contribute to the conservation and valorization of coffee genetic resources, and strengthen skills in the agriculture and food. Although this project focusses on the Tshopo Province it contributes to global coffee challenges.

The project has five objectives:

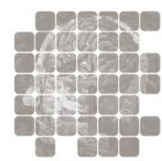
- 1) evaluating the local coffee chain, its sociological dimensions and economic relevance by carrying out surveys.
- 2) evaluating Robusta coffee genetic resources in the DRC for cultivation and breeding in perspective of their valorization by a genetic, phenotypic, chemical and organoleptic characteristics. This contributes to the coffee cultivation, characterize and indicate new, potentially interesting genetic diversity.
- 3) evaluating of existing cropping system and proposing optimization of the cropping system by analyzing i.e. macro- and micro-nutrient deficiencies in the coffee leaves of different genetic lines and an agro-ecological evaluation of the current cropping system. This results in recommendations to improve agronomic practices in order to define sustainable and profitable coffee culture, as a cornerstone for the well-being of local communities.
- 4) recuperate knowledge on Robusta kept in archives and grey literature.
- 5) integrate the results in order to formulate policy advice and a tool for the rehabilitation of the Coffee cultivation in Tshopo Province.

Each objectives has specific methodologies:

Socio-economic surveys accumulate data by rural sociological research methods. This entails a culturally sensitive research protocol, identifying a sample of knowledgeable respondents and carrying out in-depth interviews. Congolese assistants do the interviews and decode the data. Data are organized, processed and analyzed. The economic value is assessed with a method (VCA4D) developed in the framework for the EU-DG International Cooperation and Development, already successfully used in several countries. In addition the green coffee beans are evaluated by comparing cup quality of local green coffee to the pricing in the international market.

Chemical, genetic, organoleptic and soil analyses are depending from concise documentation and sampling. Each sample is linked to an individual plant. A unique universal identifier is attributed to each plant. Descriptions follow the coffee descriptor manual (IPGRI 1996).

Chemical fingerprinting, soil-analyses and genotypification use leaf samples from mature but not aged leaves from the same individuals, making it possible to synchronize the sampling effort and integrate the results. Coffee beans for organoleptic and chemical analyses of green beans are sampled on the same trees and documentation follows the same scheme. Soil samples are linked to site identifier and sampled trees. This allows to integrate (e.g. analyses of correlations) and share the data easily. The different analyses are done in the laboratories of the partners. The organoleptic evaluation is done by Raf Vandenbruel, a licensed Q-grader.



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The agro-ecology and soil-fertility is evaluated by making a survey in order to characterize and assess the current coffee systems, home gardens and old plantations.

The local use and preference of the inventoried shade trees and NTFP's are assessed through interviews at household level and at the plot sites. A soil analysis is carried out at the above mentioned plots (ca. 100 locations) and leaf samples are collected in a systematic way from 500 coffee trees. The leaf samples are assessed for most macro- and micro-nutrients by ICP-MS and for C and N by dry combustion in a CN analyser (n-500). An on-station trial is established to assess the impact of the most promising shade tree species on the most promising Robusta lines. Plots are managed to assess the impact of differences in shade, shade tree species, coffee variety and fertilization on coffee productivity. Density, growth and productivity is assessed on a yearly basis.

Study of the historic sources on coffee combines multiple methodological perspectives, such as archive prospection, close reading of archival sources and contemporary literature and network analysis. In addition, digitizing and presenting online contemporary research reports and publications.

A science based tool integrates the research results based on the available literature and the data collected in this project in order to assess the impacts of different land uses – and the anticipated changes - on biodiversity, carbon storage, local value and income modeling is carried out. The ICRAF developed tool FALLOW is tested in the DRC context. Special attention is given to different coffee development scenarios in both land sharing and a land sparing strategies. Trade-offs of the different growing systems are analyzed and reported.

The project directly contribute to the knowledge and conservation of important genetic resources Robusta coffee, the rehabilitation of the coffee culture in Tshopo province by studying the crop system and the socio-economic parameters. Indirectly it will contribute the UN-SDG's and the coffee culture wild wide.

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