Published by

Distribution of tithonia stems for making cuttings to plant. © KOTUKANYA Coffee Cooperative

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH In cooperation with



COFFEE INNOVATION

Production of Organic Fertilizer Using Tithonia Intercropping to Increase Productivity and Quality

Coffee and Farmers Benefit from Planting "Green Manure"

CHALLENGE

Most smallholder farmers in Rwanda are unable to reinvest in maintaining their farms. As a result, they not only struggle to invest in modern farming technologies but also cannot afford fertilizers or implement other techniques that could enhance productivity and profitability. Furthermore, the declining soil quality affects the extent to which smallholder farmers can derive benefits from agricultural activities.

COMPANY DESCRIPTION

KOTUKANYA is a cooperative created in 2009 with the main objective of promoting coffee cultivation and increasing both its quantity and quality of production. It is a cooperative compromising 500 coffee farmers including 145 women (29 %) and 355 men, organized in 16 farmer groups known as Producer Organization (PO) with around 150,000 coffee trees.

INNOVATION INTRODUCTION OF TITHONIA GREEN MANURE AND TERRACING

Intercropping tithonia with coffee trees in terraces and boundaries, mulching coffee with tithonia twigs and leaves, and using extracted liquid from tithonia leaves and young twigs as fertilizer and pesticide creates better quality and and a greater quantity of coffee.

KEY COMPANY STATS

NUMBER OF PRODUCER PARTNERS

500 (135 women) with 2,216 in the cooperative

NUMBER OF STAFF

49

) COST

COSTS

Costs relate mainly to:

- Collection of tithonia cuttings, their transportation to sites and farmers, terracing and planting activities
- Travel for farmers to the training sites
- · Equipment and manpower for installation of machines, machine's house, and concrete for tanks
- · Continuous terracing and planting activities, mulching and collection of tithonia leaves and young twigs to the unit of transformation, production and distribution of liquid fertilizer to farmers for application

EMPLOYMENT OF WOMEN CREATED BY THIS PROJECT 37

EFFECTS ON YIELD

30 % increase in yield the first year and 50 % increase in yield the second year



TIMELINE

Six months

(depending on procurement of equipment)

STAFFING REQUIREMENTS

- Project Manager to coordinate the activities
- Machine Operators to weigh, cut, and chop fresh tithonia twigs and leaves
- Quality Officer to follow the fermentation and distribute the product to farmers
- · Agronomist to continue trainings of farmers and the product marketing

• Machines for producing fertilizer

MATERIALS AND EQUIPMENT

- · Compost sheds and roof covering for the machine
- 1,000 litre tanks for storing liquid compost

LESSONS LEARNED

CHALLENGES

- COVID-19 caused delays and added costs.
- · Delay in machine delivery.
- · Insufficient electricity hinders the proper operations of machines at coffee washing stations.
- Extremely dry weather impacted green manure production.
- Equipment provider did not include installation and training.
- Machine efficacy and efficiency fell below expectations.

TAKEAWAYS

- · Good Agricultural Practices (GAP) training was successful: 90 % of farmers planted green manure at scale.
- 70 % of farms are using tithonia leaves and twigs as mulch.
- · Producers are looking to expand their activities to include laboratory analysis, packaging and certification of our product.

- - Electricity or a generator

RESULTS: KOTUKANYA COFFEE COOPERATIVE (RWANDA)



Theoretical trainings by ASAC Ltd and KOTUKANYA Coffee Cooperative. © Francoise Umarishavu ASAC Ltd

As a result of KOTUKANYA Coffee Cooperative's work:



90 % OF TRAINED FARMERS

are implementing GAP and production and application of liquid organic fertilizer.



472 FARMERS

were supplied over 48,000 tithonia cuttings (approx. 102 per farmer) and 35,000 coffee seedlings.



50 % INCREASE IN PRODUCTIVITY OF COFFEE

in the second year and coffee quality score increased from 82 (low specialty) to 87 (high specialty).



16 FARMER FIELD SCHOOLS

established and the cooperative can be more sustainable financially through the sale of organic fertilizer.



THE PROJECT REFORESTED 7,000 TREES

equivalent to 14 hectares.



Tithonia plants. © KOTUKANYA Coffee Cooperative

Tithonia is present in many coffee growing areas. Farmers, processors, and cooperatives can cultivate and propagate tithonia in order to produce enough to use for the following:

PRODUCTION OF LIQUID FERTILIZER

- Collect the leaves and twigs of fresh tithonia plant from the farm boundaries if not already planted.
- Cut them into smaller pieces to hasten decomposition.
- Transfer the materials into a plastic container, fill it with water and cover it loosely.
- Place the container with its contents in a shaded area for at least 21 days.
- When the content starts forming black mass, filter the content through a gunny bag or sieve and dilute the solution with water at a 1:3 ratio.
- Top dress each crop with 100 milliliters of the fertilizer.

HOW TO MAKE AND USE GREEN MANURE



Cut tithonia leaves and twigs into small pieces and apply it in the planting holes.



Or apply them on the surface and cover it with a thin layer of the soil.



Note: For better results, you can apply the manure a week before planting. It can also be applied continuously to the crops during the crop growing season.

"

The practice of mulching coffee plantations using Tithonia has effectively mitigated soil erosion using liquid organic fertilizers for farmers and has significantly improved the quality of coffee produced.

The COFFEE INNOVATION FUND has been developed and funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

MISSION: The Fund's objective is to increase the profitability of smallholder coffee farmers, and foster greater, more equitable value distribution along the supply chain through promoting innovative farming systems, transparent and inclusive business models, and access to new markets.

Contact details: Lambert Nsabimana T: 0788821874, 0722159974 E: ckotukanya@gmail.com Koperative Twongere Umusaruro Wa Kawa I Nyakbuye Rusizi-West-Rwanda



Published by: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Registered Offices: Bonn and Eschborn, Germany

Friedrich-Ebert-Allee 32 + 36, 53113 Bonn T +49 228 44 60-0 F +49 228 44 60-17 66

E info@giz.de I www.giz.de/en

Sector Programme Initiative for Sustainable Agricultural Supply Chains (INA)

Editors: Coffee Innovation Fund KOTUKANYA Coffee Cooperative Jen Green, Indonesia

<mark>Design:</mark> Shenny Purwadi, Jakarta

Photo credits: © KOTUKANYA Coffee Cooperative & Francoise Umarishavu ASAC Ltd

On behalf of German Federal Ministry for Economic Cooperation and Development (BMZ) Division 122: Agriculture, Rural Development Bonn

Bonn, Germany, 2024

On behalf of



Federal Ministry for Economic Cooperation and Development