Project objectives

The overall objective of the Action is to contribute to transformation and innovation in agriculture and food systems in Ghana through action research, application of innovative technologies and organization of farmers and multi-stakeholder dialogue platforms. The specific objective is to foster innovation for improving soil fertility in Ghana by generating scientific knowledge and data while applying innovative technology to improve threshing of grains and cereals.

Women manually threshing soybean in Ghana

Background

In Ghana, agriculture is the mainstay of the economy, with an estimated 50 per cent of the population engaged in the entire agriculture sector. Lack of technologies, weak market linkages, limited financial facilities and low extension services constrain the growth in on-farm productivity. Climate smart agricultural practices are not widely used as most farmers stick to the traditional slash and burn methods as well as shifting cultivation which do not help much in conserving the nutritional value of the soil. These practices also lead to accelerated degradation of the soil as the consistent burning leads to the destruction of the microbiome, which assist in the maintenance of the soil fertility. To maintain soil fertility, farmers largely use inorganic fertilizers which further disrupt the natural balance of soil nutrients and contribute soil toxicity. As such, mass application of inorganic fertilizers has not yielded good results for farmers.

However, the threshing of the crops in the farms could afford farmers the opportunity to use the by-products of the threshed crops as organic fertilizer on the farms. Additionally, the organic fertilizer industry is currently emerging, but its use is not widely appreciated in Ghana. In some cases, the quality of the organic fertilizer must be improved as it may come with the presence of toxic metals. To improve the use of organic fertilizer together with climate smart agricultural practices, there is a need to better characterize the variation of soil fertility in different contexts. Ghanaian soils have been classified since the early 1960s and their nutrient status broadly established, however, the fertility variations within specific local context are not known, hence the mass use of inorganic fertilizers.

Another challenge is that cereal and grain farmers use manual threshing to process their produce, contributing to post harvest losses and requiring intensive work from women and child labour for the threshing. In addition, most farmers still practice the traditional post-harvest management practices, which rely on the use of smoke to store part of their harvests. These methods, however, are not able to keep the crops as long as expected. Thus, there is a need to develop new technologies to reduce the drudgery and hardship of farmers while avoiding the dependence on fossil energy.

The ReDIAL Action was designed to contribute to addressing the challenges in Ghana's agriculture sector by these three priority actions; promote climate smart practices, improve soil fertility, and reduce post-harvest losses for grains. The project is contributing to the development of climate-resilient agriculture and food security systems as outlined in the Ghana National Climate Change Policy Action Programme for Implementation 2015–2020, and subsequent national policies on climate change. The project is aligned to the Planting for Food and Jobs (PFJ) Programme, a national agriculture policy of Ghana and as such is providing policy inputs to inform the implementation of PFJ and other agriculture projects/programmes in the project landscapes. The project was also designed

to support technologies and job creation especially for the youth, as well as facilitate livelihood diversification for smallholder farmers as an adaptation strategy to climate impacts on their farming livelihoods.

Theory of change to achieve the objectives

Due to the marginalization of most farmers including women and youth, the ReDIAL Action is making a concerted effort to bridge the gap between men and women and the youth who are engaged in farming. The Action is ensuring a positive impact on women, youth, persons with disabilities, and other marginalized smallholder cereal and grain farmers in rural areas by providing them access to innovative technologies that helps them to increase their farm prodcutivity. The Action is using a 3-prong approach to contribute to the development of climate-resilient agriculture in the project target zones. The approach includes collaborative action research, participatory piloting of innovative technologies, and dissemination of information to farmers and multi-stakeholder dialogue platforms targeted at influencing policy formulation and decision-making processes.

This Action is ensuring low emissions of Greenhouse Gases (GHG) at production and processing levels by the innovative technologies introduced. The ReDIAL Action is contributing to climate resilient agriculture especially by promoting the use of conservation agriculture technologies and organic based fertilizers associated with low carbon emission and enhanced soil carbon built up. To improve the efficient use of organic fertilizers, the Action is helping the agricultural extension officers and farmers to assess the soil fertility of farmlands using an innovative soil testing technology known as *FarmSense.* This is a Ghanaian developed low-cost soil deficiency identification technology that uses sensor technology to detect and estimate the amount of specific soil nutrients in a piece of land, including nitrogen, phosphorous, potassium, pH, salinity, and humidity.

A trained extension officer training a farmer on the FarmSense Technology

The Action is also ensuring efficient and effective threshing and zero post-harvest loss in grains and cereals threshing for beneficiaries using the award-winning *multi-crop grain thresher* technology. The Ghanaian made multi-crop thresher technology threshes rice, maize, cowpea, soya beans, sorghum and other grains. The Action is making efforts to improve the multi-crop grain thresher technology with inclusion of solar power or other non-fossil energy sources. Plans are advanced to upgrade the current diesel engine run thresher with a solar power system so that the thresher can run on solar power.

The main risks for the ReDIAL Action are:
1) Many of the target beneficiaries are low-income earners and have limited access to the financial / credit facilities. The Action is identifying and facilitating linkages between financial institutions and the beneficiary farmers.
2) Many farmers and their farms are physically located in very remote areas with limited accessibility. The Action is working with the local agriculture extension officers based in the localities. The Action also recruited five project officers (one each based in each project district) who work together with the local agriculture extension officers.

3) Sexual harassment and exploitation of beneficiaries by project staff, and harassment of project staff by beneficiaries may happen. The Action developed a safeguarding policy statement, and mainstreamed training and sensitization on the policy into project outreach activities and meetings.
4) Political will to make policy decisions and changes based on findings and recommendations of the project remains low. The Action is facilitating multi-stakeholder dialogue sessions, and disseminating empirical evidence to back recommendations.
5) COVID 19 pandemic and other epidemic were present in some of the project areas. The Action mainstreamed COVID 19 preventive measures and ensured that laid down protocols were strictly followed.

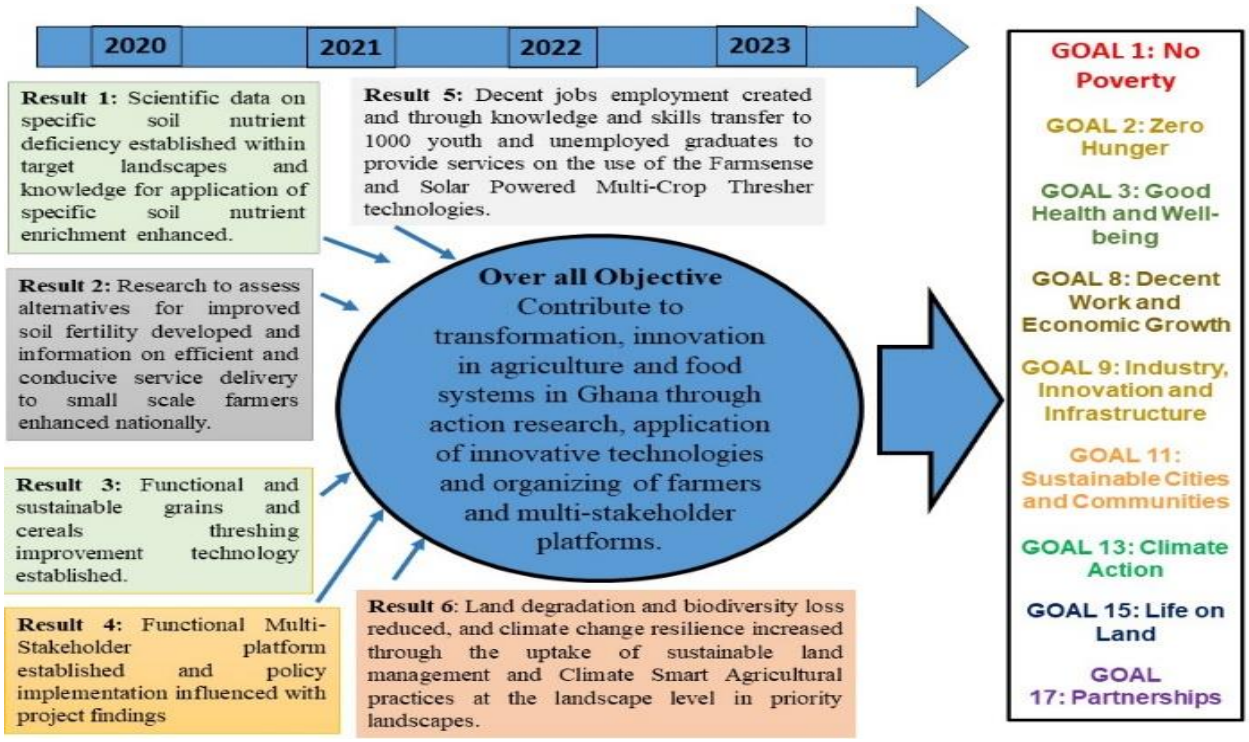


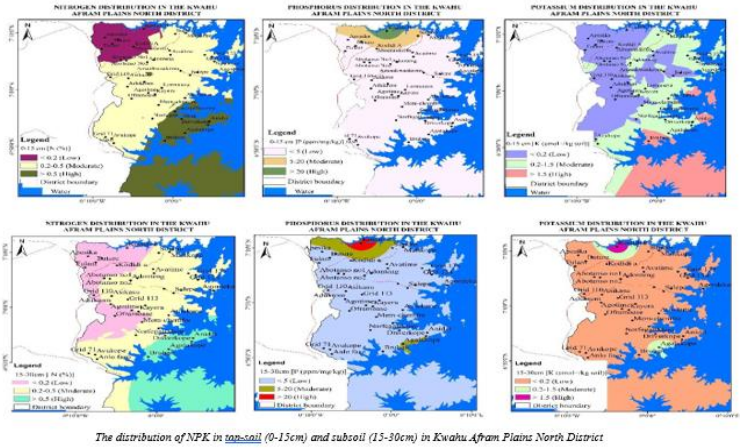
Figure: The impact pathway (ex-ante): outputs, outcomes, impacts

Main activities

The main activities of the Action are:
1) Apply FarmSense Technology for the identification of specific nutrient deficiency in soil and recommend nutrient enrichment products to be applied to promote primary production and within target landscapes.
2) Conduct Action Research on Alternatives for Improvement of Soil Fertility and share the results to target small-scale farmers nationwide.
3) Introduce and Pilot Innovative Solar Powered Multi Crop Thresher technology for Grains and Cereals.
4) Facilitate functional multi-stakeholder dialogue platforms to influence policy formulation and implementation with project findings.
5) Mobilize and build capacity of youth, unemployed graduates and farmers in the use of the FarmSense and Multi-Crop Thresher technologies and entrepreneurship skills to facilitate business opportunities and livelihood diversification.
6) Build capacity of farmers to adopt Climate Smart Agricultural practices that support increased farm productivity and efficiency but reduced environmental impact and increased capacity of farmers to adapt to climate change.

Results achieved to date (July 2023)

Over the past 3 years of implementation, the Action has achieved significant milestones in all six activity areas. Through community information sessions, training workshops and stakeholder engagements, the Action has introduced the FarmSense and multi-crop thresher technologies to a cumulative total of over 10,000 stakeholders including farmers, communities, agriculture officers and policy makers. The Action procured thirty (30) FarmSense soil testing kits and supplied three (3) each to the Departments of Agriculture in each project district, which are being used to conduct soil testing of farmlands for targeted farmers, and so far, over 1,000 target farmers have benefited from the soil testing services. Using the FarmSense technology and other laboratory protocols, the Action collected soil nutrient data in the project districts, covering 238 communities and a total of 12,725,065 ha of agricultural land, and used the information to produce 30 soil fertility profile maps for the districts.



The distribution of NPK in tan-soil (0-15cm) and subsoil (15-30cm) in Kwahu Afram Plains North District

Soil Fertility profile maps

The Action established 6 demonstration farms and 3 research/experimental fields across the districts to illustrate to farmers the effects of locally manufactured compost fertilizer on the growth and yield of cereals (particularly rice and maize). The Action also organized a national dialogue and facilitated discussions with national stakeholders and policy makers toward the formulation of a national soil policy that would regulate application of inorganic fertilizers and educate farmers on best practices and alternatives for sustainable soil nutrient enhancement.

ReDIAL has also enhanced knowledge and adoption of climate smart agriculture practices through community sensitization and training sessions. The Action developed a manual on Climate Smart Agriculture which expounds CSA methods and practices and is being used as training material for all the capacity building sessions held by the Project or Departments of Agriculture. Cumulatively, the Action has sensitized and educated over 3,500 farmers (excluding radio audience) from over 70 communities across the 5 project districts Project on CSA including conservative agriculture and use of organic compost, and encouraged them to adopt same. The Action also identified manufactures of organic compost and is facilitating linkages with farmers to enhance the use of organic fertilizers.

ReDIAL has also procured and deployed ten (10) Multi-Crop Thresher and these are being operationalised and made accessible to smallholder and vulnerable farmers within the target districts. Since its introduction to July, 2023, the threshers have been used to conducted free threshing for a total of 581 farmers (including 335 females). The Action has helped to enhance productivity and incomes of beneficiaries by reducing threshing time, producing better quality grains with higher market value, and eliminating post-harvest loss through threshing.

Training of Youth on the Multi-Crop Thresher Technology

Since inception, the ReDIAL Action has built the capacity of 1505 youths and farmers in the operation of the multi-crop thresher (215) and FarmSense (1288) technologies through intensive training workshops and field demonstrations, with the aim to transfer marketable skills and knowledge to enable them explore business opportunities in providing services to farmers with these technologies. In an effort to enhance beneficiaries' access to financial resources, the Action also mobilized smallholder farmers and facilitated the formation of 17 of Village Savings and Loans Association (VSLA), with a total membership of 521 people (349 females; 172 males). From June 2022 to July 2023, the 17 groups have mobilized a cumulative total of over GHS 427,275 (€ 34,538) and given over GHS 235,110 (€ 19,004) as loans to members at a low interest of 5%. About 80% of the membership have accessed loans at least once (with loan amounts ranging from GHS 200 to GHS 1,500), and invested it in their farming activities and also diversified their livelihoods which has positively affected their incomes and improved their livelihoods.

The Action has also established five multi-stakeholder dialogue platforms at each of the project districts, with a total membership of over 230 stakeholders, comprising smallholder farmers, farmer groups, marginalized groups (like farmers with disability), community leaders, government institutions, private sector companies, media, NGOs/CSOs among others. The MSDPs are being used to facilitate discussions on project implementation, monitor project activities and to disseminate information on project findings. The platforms are also being used to discuss and find solutions to agriculture challenges in the project districts such as lack of standards for measuring and pricing grains; weak market linkages; difficulty in accessing quality fertilizers and agro-inputs; low agriculture mechanization and limited access to equipment; limited access to financial support and credit facilities, etc. Following discussions and recommendations, relevant stakeholders are consulted and engaged to take action to address the issues.

Organization

The project is being implemented by a consortium of three (3) partners; Friends of the Nation (FoN) (the Lead), Tropenbos Ghana (TBG) and the Faculty of Renewable Natural Resources of Kwame Nkrumah University of Science and Technology (FRNR-KNUST). FRNR-KNUST leads the research component including conducting soil research to identify nutrient deficiency of soils in the project landscapes, undertaking action research to assess feasible alternatives for soil nutrient enrichment and analysing feedback from the field and providing policy recommendations for soil nutrient enrichment locally and nationwide. TBG is handling the multi-stakeholder platforms and is responsible for facilitating discourses on agriculture productivity issues in the project districts, as well as building the capacity of farmers and local authorities in the use of climate smart agriculture practices. FoN leads the project and take charge of capacity strengthening of farmers, youth, and other beneficiaries on the FarmSense and multi-crop thresher technologies, as well as, providing soil testing and threshing services to target farmers. FoN also leads stakeholder engagement processes, communication and visibility actions, community mobilization and harness policy and institutional support for the Action.

Implementing organization

Friends of the Nation (FoN) is the lead partner.

Project partners

- ✓ Tropenbos Ghana (TBG)
- ✓ Faculty of Renewable Natural Resources of Kwame Nkrumah University of Science and Technology (FRNR-KNUST)
- ✓ Other partners of the Action include SAYeTECH Company and SESI Technology, who were engaged to support with the development and operationalization of the Multi-Crop Thresher and the FarmSense Technologies, respectively.

Other stakeholders

Other stakeholders that have been involved in the implementation of the Action include smallholder farmers (men, women, youth, aged, persons with disability) and farmer groups, policymakers and members of parliament (i.e. Parliamentary Select Committee on Agriculture and Cocoa Affairs), government institutions (including Ministry of Food and Agriculture, Departments of Agriculture, Managers of the PFJ programme, District Assemblies, Forestry Commission, Departments of Social Welfare and Community Affairs, Environmental Protection Agency, etc.), academia and research institutions, NGOs/CSOs in relevant fields, agro-input dealers, media and private sector companies.

Location

The Action is in Ghana and is being implemented in the following five (5) Districts/Municipalities in five Regions: Yendi Municipality of the Northern Region, Techiman Municipality of the Bono East Region, Ejura-Sekyedumase Municipality of the Ashanti Region, Sefwi-Wiawso Municipality of the Western North Region, and Kwahu Afram Plains North District of the Eastern Region.

Funding and co-funding

EU	€ 2,000,000.00
Co-funding	€ 120,000.00
Budget total	€ 2,120,000.00

Duration

The Action is being implemented within a period of four (4) years, from 25th July 2020 to 24th July 2024.

Website and social media handles

Website: http://redial.fonghana.org/
Facebook: Redial Project
YouTube: ReDIAL PROJECT
Twitter: @project_redial
LinkedIn: ReDIAL Project
Instagram: ReDIAL Project
Telegram: ReDIAL Project

Updated on 24/07/2023