Objectives of the project:

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 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.

Picture description: 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 is 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 is a challenge. Mass application of inorganic fertilizers has not yielded good results for farmer.

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 there is a need to better characterize the variation of soil fertility in different contexts.

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. There is a need to develop new technologies to reduce labour and hardship while avoiding the dependence on fossil energy. 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. .

The ReDIAL project is 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 will contribute 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. The project is also designed to support technologies and job creation especially for the youth. The project is aligned to the Planting for Food and Jobs (PFJ) Programme, a national agriculture policy of Ghana and will provide specific policy inputs to inform the implementation of PFJ.

The Theory of Change:
Due to the marginalization of most farmers including women and youth, the project will make concerted effort to bridge the gap between men and women and the youth who are engaged in farming. The idea is to ensure a positive impact on women and youth engaged in farming and the marginalized cereals, grains, cocoa and vegetable farmers in rural areas. The project will provide them access to the innovative technologies that will help them to increase their farm prodcutivity. The project will use a 3-prong approach to contribute to the development of climate-resilient agriculture in project target zones. The approach includes collaborative action research, participatory piloting of innovative technology and dissemination of information targeting policy formulation and policy decision processes.

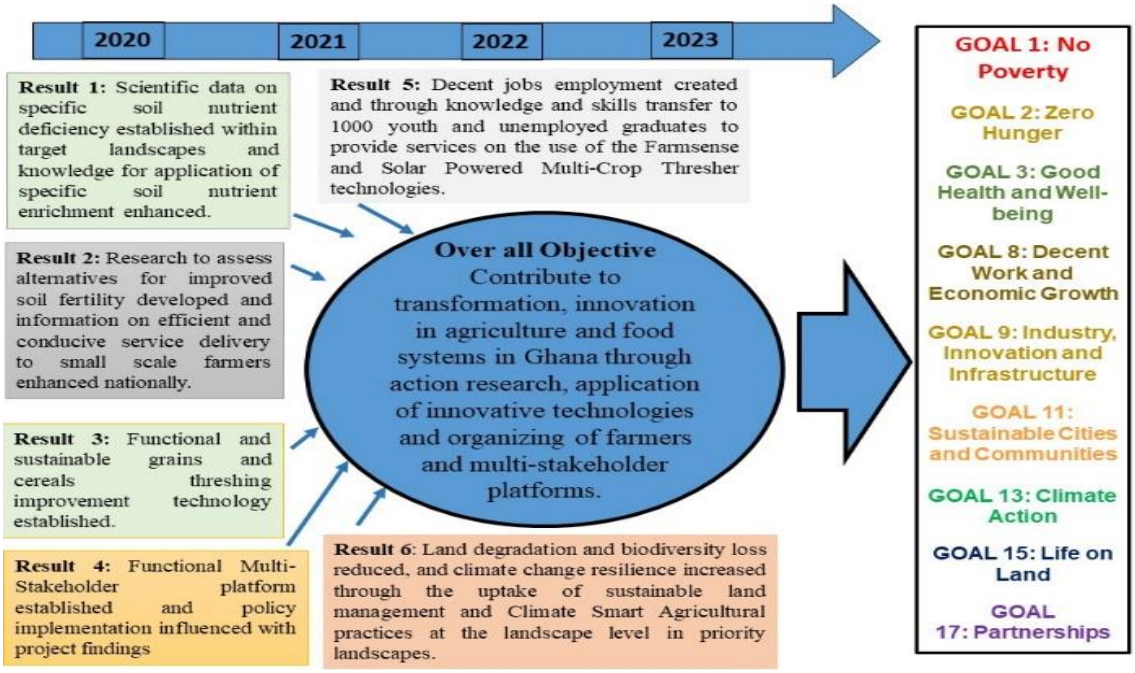
This action will ensure low emissions of Greenhouse Gases (GHG) at production and processing levels by the innovative technologies The ReDIAL project will contribute to climate resilient agriculture especially by promoting the use of organic based fertilizers associated with low carbon emission and enhanced soil carbon built up. To improve the efficient use of organic fertilizer the project will help the agricultural extension officers and farmers to assess the soil fertility. Known as *FarmSense*, this is an innovative Ghanaian developed low-cost soil deficiency identification technology.

The project will also introduce the award-winning multi-crop grain thresher technology (rice, maize and other grains) to farmers to promote effective threshing and reduces post-harvest loss in grains and cereals of beneficiaries by up to 30%. The project will improve the multi-crop grain thresher technology with inclusion of solar power. This will be achieved by upgrading the current diesel engine run thresher with a solar panel so that the thresher can run on solar power.

The main risk for the ReDIAL project are:

- ✓ Many farmers and their farms are physically located in very remote areas with limited accessibility. This challenge will be addressed by working with the local agriculture extension officers based in the localities. The project will also recruit one staff and four volunteers in each of the project zone to work together with the extension officer.

- ✓ Many low income earners in Ghana have limited access to the financing. The project will facilitate linkages between the farmers and financial institutions.
- ✓ COVID 19 pandemic and other epidemic including Cerebrospinal Meningitis (CSM) are present in some of the proposed project areas. The project will mainstream COVID 19 and CSM preventive measures and ensure that laid down protocol is strictly followed. The project will also follow with Ghana Ministry of Health and ensure that all information on the pandemic is received and the necessary actions taken by the project.



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

Main activities:

The main activities of the project are:

- ✓ Apply FarmSence 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.
- ✓ Conduct Action Research on Alternatives for Improvement of Soil Fertility and share the results to target small-scale farmers.
- ✓ Introduce and Pilot Innovative Solar Powered Multi Crop Thresher technology for Grains and Cereals.
- ✓ Facilitate functional Multi-Stakeholder platform to influence policy implementation with project findings.
- ✓ Mobilize and build capacity of youth and unemployed graduates in the use of the Farmsense and Solar Powered Multi-Crop Thresher technologies.

- ✓ 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.

Organisation

Implementing organizations:

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 analyzing feedback from the field and providing policy recommendations. TBG is handling the Multi-Stakeholder platforms and be responsible for reaching out to farmers with extension packages (information and planting materials). FoN leads the project and take charge of capacity strengthening of farmers, youth, and other beneficiaries. FoN also leads engagement processes, communication, community mobilization and harness policy and institutional support for the project.

Partners of the project:

Other partners of the project include SAYeTECH Company and SESI Technology, who will be engaged to support with the operationalization of the Multi-Crop Thresher and the Farmsense Technologies, respectively.

Other main stakeholders:

Small-scale farmers (men, women and Youth) and farmer groups, policy makers and members of parliament, government institutions (Ministry of Food and Agriculture, Managers of the PFJ programme, District Assemblies, etc.

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

Funding and co-funding:

European Union	€ 2,120,000 EUR
Total budget	€ 2,120,000 EUR

Duration: Four (4) years; July 2020 – June 2023

EUROPEAN UNION