BAYER'S *BETTER FARMS BETTER LIVES* (BFBL) INITIATIVE IN TANZANIA

INITIAL IMPACT ASSESSMENT REPORT

Dar es salaam,

August, 2021.

INTRODUCTION AND BACKGROUND

BETTER FARM BETTER LIVES was an initiative promoted by Bayer AG and implemented by Agricultural Council of Tanzania (ACT) in collaboration with AGRA in 29 districts of Tanzania mainland. The aim of this project was to help smallholder farmers overcome hunger and to ensure food security at household level in response to the after-effects of COVID-19 pandemic. Bayer was committed to donate 200 mt of maize seeds and 108 kg of vegetable seeds under this initiative, popularly known as *Better Farms Better Lives*. The initiative aimed to reach about 115,000 Smallholder Farmers (100,000 maize producers and 15,500 vegetable producers).

ACT was working closely with Local Government Authorities, CSO's and the private sector. Seed distribution started earnestly from mid-December 2020. With concerted efforts by ACT and implementing partners on the ground, maize seed distribution was completed by the end of February 2020 in all targeted districts. Distribution of vegetable seeds has now been completed.

Figure 1: *BFBL project districts.*
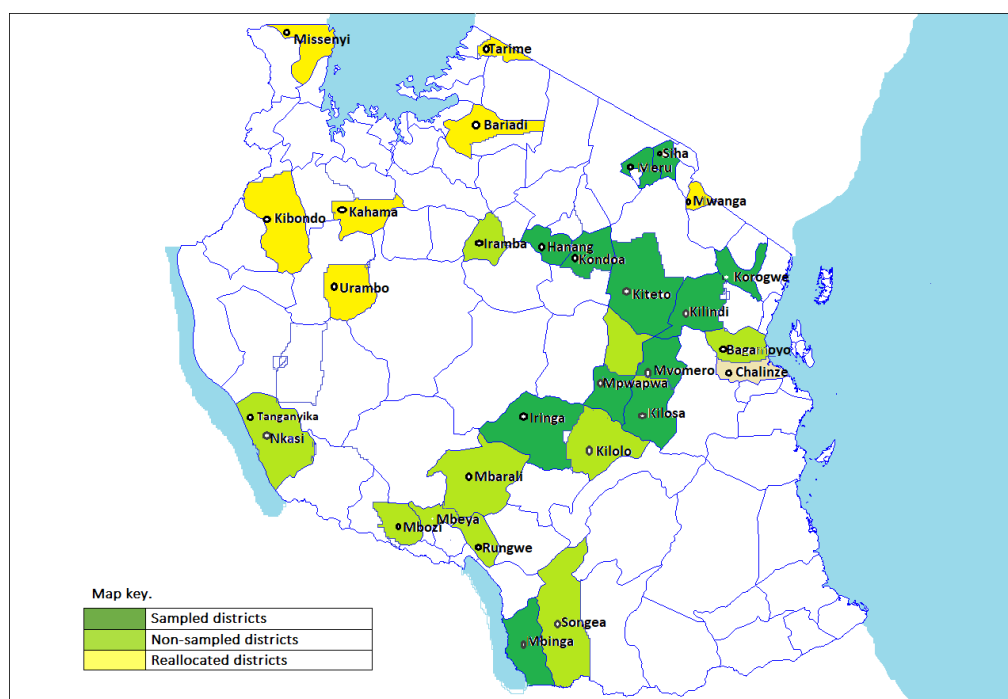
This report explicates the impact of BFBL project. Through FGDs and interviews with DAICOs, extension officers and farmers, it was revealed that COVID-19 have a considerable devastating impact on the economy, affecting incomes of enterprises and individuals; and ultimately government revenue collections and its ability to provide social and economic services. The already emerging devastating impact are even more exacerbating on women and youth in poverty and vulnerability such those in the informal sector and rural communities.

Overall status of seed re-distribution

In general, re-distribution of seed for both maize and veggie was 100% complete in all districts whereby 22 districts benefited from the initiative. A total of 18 districts benefited with maize seeds, four district benefited from veggies seed only and four district benefited by both maize and veggie seed as map above illustrates.

A total of 91,236 farmers were reached out for distribution of both donated seeds (maize and veggie). For maize seeds, a total of 183.024 mt were distributed to 84,632 farmers (34,634 female) and veggie kits 14,540 (tomato 8,740 and cabbage 5,800) distributed to 6,604 (2,495 female) farmers in all targeted districts.

Summary of Harvesting Status

Harvesting stage varies in different zones, namely: Southern highlands zone, Northern zone, Central zone and Coastal/Eastern zone. All zones are at harvesting stage expect for the coastal zone. About 80% of beneficiaries have already harvested of which 30% have shelled and the rest are still drying. In the Southern highland zone the average yield ranges from 5-7 bags[1] of maize for ¼ of an acre (Mbinga, Mbozi, Songea, Nkasi etc.). In the Central zone, yield ranges between 3 and 6 bags for ¼ of an acre (Mpwapwa, Kiteto, Kondoa etc.); whereas in the Northern zone, the yield is approximately between 4-7 bags (Siha, Meru, etc.). This narrative refers to yields for the famers who used improved seeds donated by Bayer. For famers who planted local seed varieties, yield ranges between 0 and 3 bags.

Regarding veggie seeds, 40% of farmers in Mbarali, Iringa and Mbeya have harvested and yield ranges between 150 and 200 crates (each weighing 40kg) of tomato seed (Assila F1 and Xaman varieties). Cabbage yields (Victoria varieties) range between 2000-3000 heads which is approximately 3-5 tonnes. So far, both veggie varieties were appreciated so much by most farmers who already harvested. Farmers testified that the donated seeds have very good quality compared to other varieties they have produced in the past. In addition, Bayer tomato seeds were reported to be relatively tolerant to diseases.

One of the challenges observed during the implementation phase is the high prices (range from 100,000-150,000 Tsh per 8g) of veggies seed especially for Assilla F1 (tomato seeds), thus many farmers asserted that they could not afford hence suggested price reduction within a range of TZS 10,000 – 50,000.

Actually, harvesting stage is at its peak this August and by the end of this month, all farmers in the Southern Highlands will have finished harvesting. In the Northern Zone, harvesting will mainly be in September up to October because of the weather variability during this year's main cropping season.

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[1] Each weighing approximately 100 kg

Sample, Sampling procedures, and Data collection.

The impact assessment survey was a holistic attempt to provide vital information on the outcome of BFBL project intervention. Furthermore, the objectives were to; measure changes happening at the household level in terms of productivity and food security; and provides evidence of project success or failure.

The DAICO offices with their expertise in each crop (Maize, Tomato and Cabbage) and their practical experience in the seed sector determined their participation, and aptitude to triangulate the given data. The FGD's typically took 45 min to 1 hour, and the output in each case was a draft narrative. It did occur that FGD's yielded different insights to the survey, which were acted upon.

The information collected (both qualitative and quantitative) provided the basis for assessing project performance; making future decisions on strategy and project operations for better results and more efficient use of resources for the next phase (if the project continues).

Selection of Districts and Villages

The BFBL impact assessment sample frame was the districts, villages, and households where the project intervened. As the project is being implemented in 25 districts across the country, the sample of 122 districts were selected for the survey with the basis of taking into account all project coordination zones (At least 1 district was selected in each zone) and up-to-date field status of the particular district.

Accordingly, 40 sample villages were chosen, using stratified random sampling. By stratification the study tries to recreate the statistical features -of the population by splitting it into various distinct segments (the districts and villages) and selecting entities from each of them to ensure that every category of the population is represented in the sample. The M&E team selected at least 3 villages in each district i.e., 1 village located in lowlands, 1 in highlands, and 1 in midlands to examine the growth performance at different climatic condition.

Sample selection of household beneficiaries

The survey used two different sampling frames; the list of districts/villages and the list of beneficiaries served by the project. In the sampling design the project used two-stage cluster sampling, one cluster consisting the list of districts/villages served by the project, and the second cluster consisting the list of beneficiaries served by the project.

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[2] Mvomero, Kilosa, Mpwapwa, Iringa, Kondoa, Kiteto, Kilindi, Chalinze, Korogwe, Siha, Meru and Hanang.

A stratified random sampling approach[3] was used to pick the list of the project beneficiary households in selected districts. The use of stratified random sampling was preferred since it is cheaper and more straightforward sampling method. Prior to the survey, a total sample of 432 respondents[4] (36 per district and 12[5] farmers per village) were determined to be representative for collecting information on project performance. A total of 558[6] from 40 villages was sampled for FGD's and interview. The exercise of sampling farmers was done at village level by involving field extension officers/VBAs.
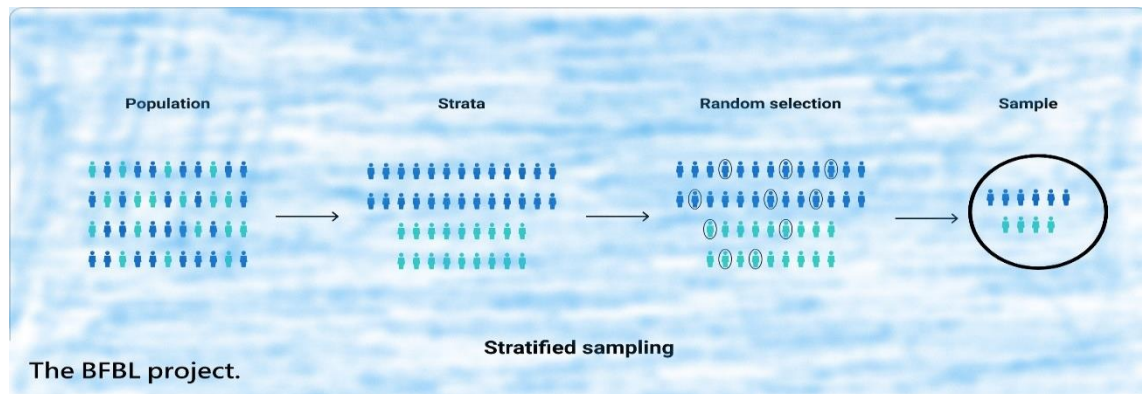

Diagram 1: The stratified random sampling approach.

The survey team used both FGD's and interviews for collecting data/information. FGD's for in-depth understanding of the SHF's motivation and perceptions towards improved inputs especially Bayer seed. The quantitative data was collected through discrete interviews and general questions in FGD's. Generally, both have provided more insightful results.

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[3] Population is divided into subgroups, called strata, according to some variable or variables in importance to the study.
[4] 12 farmers per village * 3 villages per district * 12 districts = 432 farmers.
[5] Select disproportionate, four (4) farmers for each group of 3 strata i.e., Good, Moderate and Poor performed beneficiaries
[6] Since the survey used FGD's, the number came depending on village/district response.

THE IMPACTS OF BFBL PROJECT

Overall Project Scope

The BFBL project was implemented in 22 districts of Tanzania mainland. The project came to an end in July 2021 with remarkable achievements, it had reached an approximate total of 100,000 smallholder farmers (90% of the LOA target) by redistributing 183.024 mt of maize seed to 84,632 SHF's (34,634 female) and 14,540 of vegie kits (tomato 8,740 and cabbage 5,800) to 6,604 SHF's (2,495 female) in all intended districts.

The positive outcomes of BFBL project are clearly been visible among the smallholder farmers who have benefited from the project directly or indirectly. There are increased well-being and prosperity among smallholder farmers in the project areas but these aspects would better be captured in an ex-post evaluation.

Technically, impacts of an initiative or project are measured after the end of such an undertaking i.e. at ex-post evaluation stage which takes place months or even years after expiry of the project period. For the BFBL initiative in Tanzania, it is understood that some of the impact changes started to occur earlier during the life of the project and that is why this exercise was undertaken. However, one important caveat is that; measuring the impacts at this stage (when the project has just ended) might not be able to capture the full extent of the results nor their sustainability.

Increased Productivity of Smallholder Farmers'

The performance of maize varieties was impressive with overall germination rate of more than 90% and plant growth was robust. With the exception of early blight and tuta absoluta in some districts such as Mbarali and in some areas of Meru district, no serious pests and diseases affected veggies.

An estimated contribution of the BFBL project to the household production derived from the estimated area planted by donated seed, and average yields obtained. The analysis assumed that, the recipients of donated Bayer seed did not receive any other seed from alternative sources and they would simply have planted less or not at all if they would have not received the donation. According to this calculation, the average household achieved an additional 387.5kg of maize grain. The data for tomato and cabbage are missing as most of farmers had not either planted nor harvest when the survey was conducted.

The table below provides the available estimates of a particular district for the average yield [7] of BFBL beneficiary household. The bags of maize weighs 100kg.

Table 1. Total and Upper limit of the mean values, 2021 BFBL seed harvests.

District	Total area planted (ha)			Mean Yield per area		
	Maize	Tomato	Cabbage	Maize bags/0.25	Tomato	Cabbage
Mvomero	397			2.5		
Kilosa	499.2			5		
Mpwapwa	600			5		
Iringa DC	648			2.5		
Kondoa	400			4		

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[7] Each farmer received 2kg of maize seed which is enough to plant ¼ acre.

District	Total area planted (ha)			Mean Yield per area		
Kiteto	500			4.5		
Kilindi	409			3		
Chalinze	455			4.5		
Korogwe	351			2		
Siha	526.7			5		
Meru	750			5		
Hanang	400			3.5		

Source: ACT/BFBL Monitoring Surveys, 2021.

Increased Food Security

Seeds are critical for addressing the dual challenges of food insecurity since farmers depend on quality seed of appropriate varieties to attain adequate produce. However, in recent times, COVID 19 had an increasingly devastating impact on rural livelihoods and crop production. As a result of trade blockages and increased transaction costs, it halted crop production, limiting accessibility of agricultural assets, and hindering farmers' access to agricultural inputs which leads to decreasing food security.

White corn is the main staple grain consumed in Tanzania with the annual per capita consumption of 135kg per person per year. It provides 80 percent of dietary calories and more than 35 percent of utilizable protein to the population" *(USDA Tanzania corn report,* 2019*).* Thus, an average household of 5 members[8] required approximately 675kg of grains for direct consumption to meet its requirements for a year. The relative contribution of the BFBL program to the household food security was measured in terms of the total harvest level per household.

The analysis of the table 2 below has an assumption that, the beneficiaries neither plant nor harvest any other crop except of Bayer donated seed, and has good post-harvest management.

The results coincide with the estimates from farmers of how long their grain supplies are expected to last in a year. In correspondence with the production data displayed in table 1 above, 6 districts appear to have reasonable grain stocks, 3 have intermediate grain stocks and 3 districts of Iringa DC, Korogwe and Mvomero appear to have experienced seriously production shortfalls either because of late distribution, poor rainfall, poor crop management or the limited availability of farming resources.

Table 2. Contribution of BFBL Project in Food Security Proportion to Household per District.

N/o	District	Number of months	Food security per household (%)
1.	Mvomero	4.7	40
2.	Kilosa	9.5	78.7
3.	Mpwapwa	9.5	78.7
4.	Iringa	4.7	40
5.	Kondoa	7.6	63
6.	Kiteto	8.5	70.9
7.	Kilindi	5.7	47.2
8.	Chalinze	8.5	70.9

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[8] [8] Households in rural areas of Tanzania had an average household size of **4.9 members** between 2017 and 2018. (TBS)

N/o	District	Number of months	Food security per household (%)
9.	Korogwe	3.8	31.5
10.	Siha	9.5	78.7
11.	Meru	9.5	78.7
12.	Hanang	6.6	55

Source: ACT/BFBL Monitoring Surveys, 2021.

Changing of Farmers' Perspective towards Improved Seeds

The BFBL project went beyond its core objectives of overcoming hunger and increasing productivity of smallholder farmers to prompting and influencing good agricultural practices including the use of improved inputs. The initiative had elements of not only socio-economic but also socio-psychological features such as perceptions and motivations that influenced the adoption of good management practices and technologies by farmers.

The project explored farmers' motivations and perceived impediments for sustainable intensification practices (in this case the use of improved seed varieties). The project with the partnering of district agricultural and extension officers in implementing both core and supplementary project's activities such as provision of GAPs and FAB education to smallholder farmers have helped to positively change the perspective towards improved inputs.

Table 3: Proportion Number of Farmers Expecting to Use Improved Seed Next Season

N/o	District	Current status		Foreseeable
		Local seed (%)	Improved seed (%)	Interested to use Bayer seed (%)
1.	Mvomero	30	60	60
2.	Kilosa	30	60	60
3.	Mpwapwa	60	40	95
4.	Iringa DC	40	70	90
5.	Kondoa	62	38	60
6.	Kiteto	50	50	80
7.	Kilindi	70	30	70
8.	Chalinze	54	46	55
9.	Korogwe	75	25	90
10.	Siha	20	80	85
11.	Meru	50	50	80
12.	Hanang	70	30	50

Source: ACT/BFBL Monitoring Surveys and Zonal coordination reports, 2021.

The surveys reveal that, due to project contribution on education, right information, motivation, and expectation of profitable investment (more yield), farmers are expected to invest in and implement sustainable technologies and farm practices. First user farmers (about 80%) are now asking about the availability of these seed for the next season. There could be a significant potential for market

expansion in the target areas which Bayer think of exploiting.

Potential Bayer's Market Share & Size

The efficacy of Bayer seeds anticipated to attract more customers and help widen the customer base, increase sales and market share of the company. Correspondingly, the project helped to advertise brand of a company as for now many SHFs (New users) are able to identify DKC variety by its attributes over another. From the table 3 above with the assumption of easy seed accessibility and affordability to SHF's, the market share of the company is expected to raise simultaneously by servicing 72.9% of the total market size. The unit sales or the turnover of the products will be measured in a given period ex- post of the project.

The company is advised to strengthen customer relationships by selling more and penetrate to new customers and focusing on customer service and marketing efforts on retaining existing customers by selling through new channels such as Direct to Customers (D2C) & Business to Business (B2B) and into new markets.

Sustainability of the Project

Engagement of district agricultural and extension officers and inclusion of the public sector especially LGAs will lead to the continuation of all successful activities conducted by BFBL project especially using of improved seeds (Bayer seeds). District Agricultural Officers of various districts used this project opportunity by committing themselves to disseminate the best farming practices in their districts (especially to other villages that were not aware of improved seeds). Also sharing of testimonies between farmers and DAICO's in their regions at large will help the spreading out of improved seed technologies. Kiteto and Mpwapwa districts are very good examples of these efforts.

Lessons learnt

During the implementation of the initiatives observed that most famers are aware about the importance and benefits of apply good agricultural practices (GAP) at their production especially improved seeds, spacing and fertilizers but don't apply them because of inadequate technical training and high price of inputs.

The DKC variety performed wonderfully almost in all areas with donated seeds. This is expected to ensure increased uptake and promising market for the Bayer products in the coming season. However, during the previous season it was generally observed that DKC varieties were in short supply especially in the Southern Highlands. This is an opportunity for the company to take advantage and step up production and distribution of its branded seeds in order increase market penetration starting with the next season and beyond.

Also full involvement of government extension staff is very useful, because they can complement project's efforts and provide technical backstopping even after the end of the project.

Another important lesson is that increasing productivity through improved inputs especially seeds need to be delivered and available on time; like two or three months before cultivation begins. This will give farmers a room to adjust additional use of their limited resources for proper planning of their farming operations.

Challenges and Recommendations

Lack of clear targeting criteria

The project did not set the clear criteria of the targeted beneficiaries. Lack of uniform criteria to all districts led to some districts such as Kilindi to distribute the donated seeds to all (21) farming villages which bear difficult spread the impact-effect of the project. Correspondingly to the selection of beneficiary household, other districts were using productivity performance of an individual farmer, others used level of food security at household level etc as the criteria to identify the project beneficiaries.

Clear criteria in terms of location, numbers and features for targeted beneficiaries who expected to be installed in the project's activities should be identified prior the implementation of the project. This will help to have uniform and comparable level of impact between villages and districts at large.

Logistics challenges

The problems of rural transport were largely manifested in terms of late re-distribution of seed to most of the districts. As sampled districts of Kilindi and Mpwapwa where there is poor transport infrastructure and the beneficiary villages are widely scattered. This raised costs and timeliness as observed during routine monitoring of both VBAs and ACT monitoring team. This also likely contributed to poor production.

ACT should strengthen the partnership and communication with LGAs in order to plan areas where the project will be implemented considering the infrastructure and available transport facilities for re-distribution and monitoring activities.

VBAs to Smallholder Farmers Ratio

During the implementation of the project one VBA required to serve and supervising average of 200 maize farmers and/or 100 veggie farmers. The number of farmers to serve were high with minimum skills in advance for efficient supervision for VBA/government extension officers.

ACT, DAICOs and extension officers recommend number of farmers to be reduced to at most 50-100 per VBA. This will help to increase efficiency in facilitating farmers with skills for upscaling their level of productivity.

Late Redistribution

The timeliness for re-distribution especially maize seed, to some districts such as Iringa DC and Kiteto was a big challenge and probably led to poor plant growth. This disrupted the cropping calendar and was among the factors of challenging growth and lower productivity than anticipated.

The project should start earlier before the planting season. The redistribution need to consider the cropping calendar of the particular district effectively.

In future if this initiative continues, it is recommended to provide backstopping technical assistance to both farmers and VBA's (field supervisors), as well demonstration plots and field days should be considered for providing a learning environment for famers among themselves. Full package of seeds, fertilizer and pesticides should be provided together to enable attainment of the full benefits of Bayer's improved seeds.

Possibility of Further Collaboration in Future

ACT is currently implementing the Partnership For Scale (PFS) project in 33 districts of mainland Tanzania to promote 7 value chains – maize included. This partnership facilitates different activities to enable private sector players operate efficiently and profitably along the value chains. These include farmers' access to productivity-enhancing inputs, promotion of climate smart agriculture technologies, commercial and financial linkages for smallholder farmers, agro dealers and grain off-takers, post-harvest management and market linkages.

Bayer Tanzania and ACT can continue working together in future to promote Bayer's seeds and other products to smallholder farmers thereby effectively creating rapid input demand. This will be possible through the use of demonstration plots to impart agronomical knowledge and skills to farmers. ACT can leverage resources from the PFS project in partnering with Bayer Tanzania under this endeavor.