

ENHANCING THE POTENTIALS FOR YOUTH AGRIPRENEURSHIP AND INCLUSIVE AGRI – FOOD SYSTEMS IN SUB SAHARAN AFRICA: A CASE OF N2AFRICA BORNO PROJECT

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ABSTRACT

Currently around the globe, particularly in sub Saharan Africa, there is an increasing call for youth engagement in agriculture/agribusiness. The argument of proponents is hinged on the inherent demographic advantage but increasing joblessness, food insecurity and youth restiveness. This paper interrogates this position through the prism of the youth focused activities of N2Africa project in Borno State, Nigeria between 2014 and 2019. We propose an operational framework and model for youth engagement in agripreneurship with a remarkable influence on agri-food systems, and spill-over effect on rural economy, community resilience and cohesion. We discovered an emerging window for international research institutes to directly link research to development. Thus, through massive mind-set re-orientation and capacity building in science-driven agricultural production technologies, entrepreneurship development, internships, starter package, facilitation of access to credit, and mentorship in a unique model; the response of, and the impact on the targets have been impressive. The prevalence of insurgency and high level security concerns in the project area notwithstanding, there is a significant progress in breaking the myth around the drudgery and perpetual poverty associated with agriculture among the younger generation. About three hundred directly trained and empowered youth were employed in agricultural value chain

Introduction:

N2Africa project is basically Putting nitrogen fixation to work for smallholder farmers in Africa through enhancing the yield of grain legumes (common bean, cowpea, groundnut and soybean) and expanding the farm area cropped with legumes to improve farmers' incomes, food and nutrition security. N2Africa's main focus is to build sustainable, long-term partnerships to enable African smallholder farmers to benefit from symbiotic N₂-fixation by grain legumes through effective production technologies including inoculants and fertilizers. Accordingly, N2Africa Borno State project under this initiative focussed and reached over 40,000 farming families and initiated models for youth engagement in agri-business through which over 2000 job opportunities were created for different categories of youth in Borno state.

Given the peculiar circumstance of the entire north-east Nigeria, particularly Borno State as the epicentre of ongoing terrorists and

enterprises, with an average cost-benefit ratio (CBR) of 1:1.3, and are most importantly creating job opportunities for other young men and women in Borno State.

Keywords: *Agricultural value chain, Unemployment, Youth Agripreneurship.*

Insurgency activities; N2Africa intervention in Borno State is premised on the fact that young people who are in most cases the foot soldiers of insurgency, must be targeted, re-oriented and given the skills, resources, and opportunities that will enable them become self-dependent. This was achieved through active engagement in agribusiness for sustainable income and livelihood, with the hope of positioning them as active promoters of stable democracy and cohesive communities with strong regional economy. It is a standard understanding and consensus among development practitioners that peace, progress and prosperity automatically become elusive where nations fail to meet the needs of the young population (USAID, 2012a). It is pertinent to add that Borno State, Nigeria is one of the fifteen (15) certified desertification frontline states with a land area of 72,609km², occupying about 7.98 percent of the Nigerian land space (NBS, 2010), making it the biggest state in the federation by landmass.

More than half of the global population figure is represented by young people under age 30 who are challenged by chronic joblessness and socio-economic insecurity. Notwithstanding this predicament, young people remain the repository of the wealth of nations. This therefore validates the multiplicity of calls for a strategic shift towards the engagement of youth as agents of change towards increased food production, improved agri-food systems, job creation, improved livelihoods and reduced youth restiveness. This was experimented in Borno State, Nigeria; under the N2Africa project, funded by the Bill and Melinda Gate Foundation, implemented by the International Institute of Tropical Agriculture.

According to the UN, about 136 Million young women and men between 20 and 34 years in sub-Saharan Africa (SSA) are living in rural areas, with limited or non-existing job opportunities (GIZ, 2017). Increasing investments in education are resulting in a corresponding increase in educated yet unemployed, and perhaps unemployable youth across SSA (AGRA, 2015). According to USAID (2012a), young people constitute the largest share of the population in developing countries. The International Labour Organization (ILO, 2012) estimates that over 75 million young people worldwide are unemployed and more than a billion jobs must be created in order to accommodate increasing number of job seekers and reduce unemployment. These figures strengthen the claim that unemployment rate among young people particularly in SSA is alarming with fearful consequences if left unaddressed. According to Restless Development International, "Eighty-five percent of Taliban recruits [and accordingly Boko Haram, Al-Shabab et al.] are under 25" (Lin, 2012); mainly due to socio-economic frustration and joblessness. Therefore, there is a consensus of opinion that increasing poverty, youth unemployment and food insecurity have contributed to youth restiveness and the lingering insurgency in Borno State, north-east Nigeria. By extension as evident, this phenomenon has become a time bomb that is already detonating, not only in sub-Saharan Africa (SSA) and the Middle-East, but around the globe.

Youth and women engagement and inclusion in agri-food systems, particularly off-farm opportunities (like cottage processing, marketing etc.) in the value chain have been proven to increase household incomes, food and nutrition security. Conscious targeting and engagement of

the sector will accordingly facilitate agriculture-led economic growth, improved resilience and livelihoods. It is also proven that young people are beginning to show interest, but require a quantum of support to succeed (Giuliani et al., 2017), and effectively make the transition from hopelessness to a decent, meaningful and sustainable livelihood. The common parlance in Africa “A hungry man is an angry man” aptly describes the urgency of youth engagement in agriculture/agribusiness for the continent.

However, in spite of the ugly scenario, the youth demography presents an enormous opportunity for wealth creation. It therefore becomes an imperative to consciously invest in the youth; in the manner N2Africa operated in Borno State, in order to reap the benefits of demographic dividend. Thus, the growing African youth population should rather be harnessed into a productive force for development, than seen as a social problem. The experience of IITA Youth Agripreneurs (IYA), including the Borno youth agripreneurs (BYAP), is indicative of the fact that young people could be engaged in agriculture to make a decent living. It is in this regard that the N2Africa Borno State project promoted a youth agripreneurship activity with the following objectives;

- 1) To reinforce the calls for youth in agribusiness as the panacea for increased food production, improved food and nutrition security, increased job creation, improved livelihood and reduced youth restiveness.
- 2) To support the process of strategic conceptualisation and effective implementation of youth in agribusiness schemes in SSA, through shared experience.
- 3) To showcase N2Africa Borno Youth Agripreneurs (BYAP) scheme as a programmatic expression of IITA’s fresh policy focus on linking research to delivery and impact, thereby systematically positioning the youth in agribusiness concept in the CGIAR system.

The genesis and nemesis of youth unemployment

Who is a youth? The question presents as many answers as there are respondents across cultures and regions. United States Agency for International Development (USAID, 2012a) defines youth as a life stage that is neither finite nor linear. A number of multilateral institutions choose to define youth as young persons between ages 15-24 years for statistical purposes. However, in the realms of policy and programming, sovereign countries and organisations expand the outlook to accommodate a host of cultural differentials and diversity in the transition to adulthood (USAID, 2014). The Nigerian National Youth Policy (2009) describes this population as “one of the greatest assets that any nation can have. Not only are they legitimately regarded as the future leaders, they are actually the greatest investment for a country’s development”. The policy further established that the youth shall comprise of all young males and females aged 18 – 35 years, and by the 2013 revised policy aged 15 – 29 years, who are citizens of the Federal Republic of Nigeria. The foundation of the current crisis of youth unemployment was inadvertently laid by the society. This is indicative of government approach to the development of the agricultural sector over time. Accordingly, the genesis of the nemesis could be discerned from the privileged positioning of white-collar jobs over agriculture, the failure to develop the agricultural value chain, the failure to consciously develop and deploy potent strategies to entice young people into agriculture as a means of earning a decent, prosperous and sustainable livelihood. This nemesis is fast becoming a monster, and leading to the development of a deep-rooted negative perception (by the youth) of agriculture as a job that is too laborious, a job for illiterates, poor people, idle people; and regrettably as an occupation of last resort when everything else has failed.

This situation is further bolstered by parental preferences and influence in the choice of their wards' career. Poor harvests from agricultural fields and pervasive land degradation in SSA are additional issues preventing young people from embracing agriculture. Specifically in Nigeria, the graphic picture of the trend of youth unemployment could be seen from the staggering figures of graduating students from the tertiary institutions and/or participants in the National Youth Service Corps (NYSC) each year. On average about 250,000 graduates pass through the NYSC scheme every year into the job market, with less than 10 percent getting gainfully employed. The consequences are legion; including elevated crime level, social disturbances, increasing poverty, pervasive food crisis and 'desperate journeys' (migration) across the Mediterranean.

Prospects for youth in agriculture

Agriculture is the key sector that most African countries are relying on to promote economic development. In order for this dream to manifest there is the urgent need to transform, revolutionise and commercialize the sector. Current studies suggest that the involvement of youth in agriculture is very important for SSA. It offers great opportunities to create jobs for themselves and others (AGRA, 2015). Effective youth engagement in agriculture/agribusiness is critical to several efforts to modernize the sector, which is dominated by an aging population. Agribusiness offers genuine opportunities for job and wealth creation for young people (Sumberg, J. et al., 2017; Losch, 2016; and Filmer et al., 2014). According to Nwanze, 2016; cited in IITA youth agripreneurs (IYA) bulletin October 2016 special issue), "25 percent of the world's arable land is in Africa, but it generates only 10 percent of the world agricultural output. In spite of that, Africa is importing 35 billion dollars' worth of food every day and Nigeria imports 6 billion dollars' worth of food every year. By 2025 we may be looking at 100 billion dollars import bills". This is absolutely unsustainable and there-in lays the window of opportunity for the smart youth agripreneur. We have the resources as a country to do business in agriculture and succeed. Nigeria has about 84 million hectares of arable land (table 1).

Table 1: Classification of Nigeria's Agricultural land

s/n	Utilization	Size (m'ha)
1	Arable	28.2
2	Fadama	2
3	Permanent crops	2.5
4	Forest/wood	10.9
5	Pasture	40
Total	-	83.6

Source: Adapted from: Akinyele (2009). IFPRI/NSSP background paper 7.

Nigeria tops the list of cassava, yam and cowpea producing countries around the globe, yet it is a food-deficit nation depending on import of grains, livestock products, and fish (IFAD, 2012). According to the FGN/CBN Anchor Borrowers Programme (ABP - 2016), Nigeria is the largest producer of rice in West Africa but also the second largest importer of rice in the world. Nigeria produces 2.55million metric tons of the estimated 6.1 million metric tons it consumes annually. Nigeria has about 600,000 hectares of land suitable for wheat production but only 10 percent is

in use for wheat farming. Nigeria requires about 2.66million metric tons of fish annually to satisfy the dietary requirement of its citizens, but aggregate domestic fish supply (from captures and culture fisheries) is less than 0.7 million metric tons per annum. Local production of sugar is estimated at 50,000 metric tons while domestic demand is about 1.15m metric tons. Local production of soybean is very low against what is required by processors. Again, according to N2Africa phase I report (Woomer et al; 2014), Nigeria has a culture of cottage industry processing of grain legumes with a 700,000 metric tons per annum soybean processing plants capacity, making it the largest processor in Africa. Yet there are gaps for industrial crushing capacity. Only about half of the available arable farmland and 7 percent of irrigable land are being put to use, while the population keep multiplying rapidly putting pressure on food security. This clearly exposes the huge window of opportunities for wealth creation that is lurking untapped in agriculture.

Agribusiness is profitable with the potential to revive Nigeria's ailing economy. Agriculture provides the greatest sectoral opportunity to create jobs for the teeming youth population. Agriculture is the starting point for development, evidently where the world industrialized countries in Asia, Europe and the Americas started from. The recurrent glut in the crude oil market implicitly adds to the prosperity that is locked-up in agriculture and its value chain. Abundant opportunities exist in the value chain because of the shifting emphasis toward the market systems as the main driver of production, service provision, and value addition. Value chain processes/agri-food systems enhance the gradual transition from artisanal farming to industrial agriculture.

Main challenges of youth in agriculture/agribusiness

Young people are basically not attracted to farming or agriculture for a living for the reasons earlier identified under the genesis and nemesis of youth unemployment. Those who manage to take the decision to venture into agriculture, in response to the various interventions and professional engagements, somehow still find themselves challenged by various obstacles that include;

- 1) Lack of access to farmland.
- 2) Lack of start-up capital or grant.
- 3) Lack of unhindered access to credit facilities.
- 4) Lack of modern/science-driven agricultural production skills.
- 5) Lack of entrepreneurial/business planning and management skills.
- 6) Lack of easy access to input and output markets.
- 7) Poor infrastructure (roads, water, electricity, transportation, rural communication networks, rural financial services/institutions).
- 8) Lack of access to business development services, business risks absorption framework, and mentorship opportunities.
- 9) Social insecurity and lack of safety net.
- 10) Cascading market prices and galloping inflation.

Methodology

Implementation approach

Implementation approach of the Borno youth agripreneurship scheme involved a framework that defines the practical values of Engagement, Support, Influence, Mentorship and Sustenance

(*ESIMS*). This framework is expressed in the "*Tripod sustainability model*" featuring three main stages (Foundation, Technical support, and Sustainable exit) with several components such as, targeting, screening and recruitment, needs/capacity assessment, stakeholders identification and engagement, training/capacity building, business planning, internship, business registration, starter pack, business activities, access to input and output markets, access to credit, access to last-mile extension services, mentorship and business development activities, monitoring and evaluation, and exit strategies; that combines to enhance goal attainment (Fig 1: appendix 1).

Data collection

The study methodology includes primary data collection at individual and group levels using structured questionnaire programmed on open data kit (ODK), and interview guides that were used in interacting with youth agripreneurs in different enterprise groupings (i.e. grains production/farming and marketing, grains processing and feed milling, poultry production, animal fattening, fish farming and marketing, input supply, local fabrication of labour - saving tools and spray service providers (SSPs) (fig. 1a), located in Wandali, Briyel, Biu, Maiduguri, Teli, KwayaKusar and Marama communities in Borno State, Nigeria. Multistage sampling technique was deployed to select the sample size of 122 (40.7 % of the total population). The final stage of the sampling process was assigning of a proportionate sample size to each enterprise group.

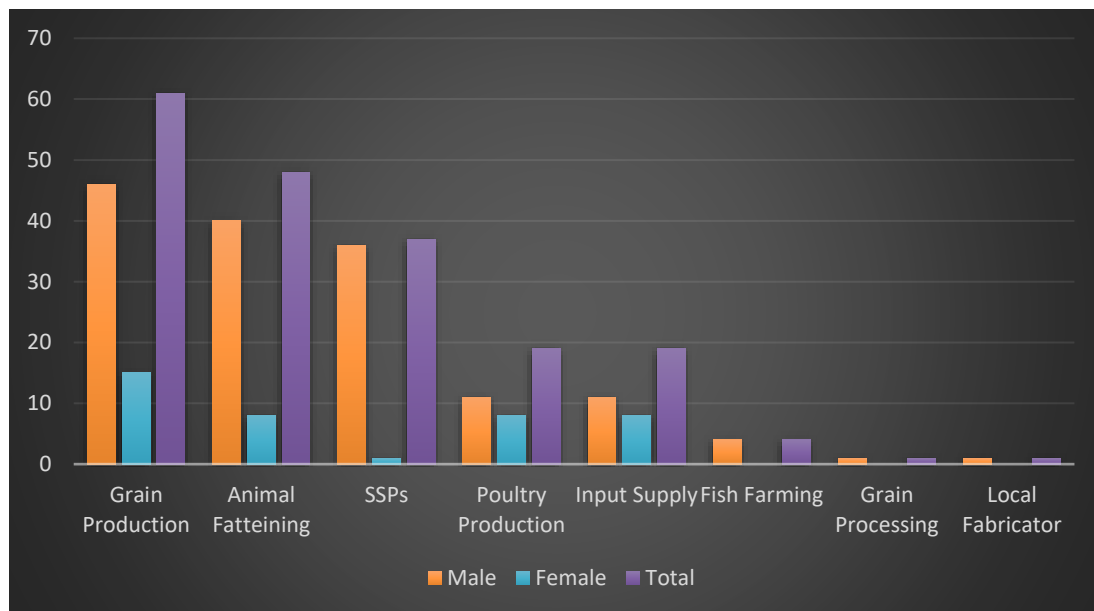


Figure 1a: Distribution of respondents across enterprises

Focus Group Discussion (FGD) was carried out with relevant groups, comprising of value chain actors selected from all the enterprises. FGD allowed respondents to discuss topics in greater detail, explore and clarified their points of view, thus enhancing in-depth discussions which gave the moderator the opportunity to probe deeper on salient issues and for meaningful sub-cell analysis used for reporting.

Scope

The study covered 300 youth agripreneurs from 8 enterprise groups based in Wandali, Briyel, Biu, Maiduguri, Teli, KwayaKusar and Marama communities in Borno State, Nigeria. The Maiduguri cluster comprised of mixed youth agripreneurs from the north and central zones (LGAs) of Borno State. They were brought under one cluster at the state capital for enhanced access because of security concerns. The status of benefitting agripreneurs compared to when the intervention started was examined and analysed. All enterprises were grouped for overall assessment of intervention impact, opportunities and challenges. The agripreneurs also self-evaluate themselves on how series of intervention activities had contributed to their different business objectives and livelihood. Viability of the enterprises without further support was checked with recommendations on what would be expected of the agripreneurs to sustain the trend. Changes that occurred with plausible link to the project interventions, and as a consequence of indirect influence of interventions (intended or unintended), either positive or negative was examined.

Results and discussion

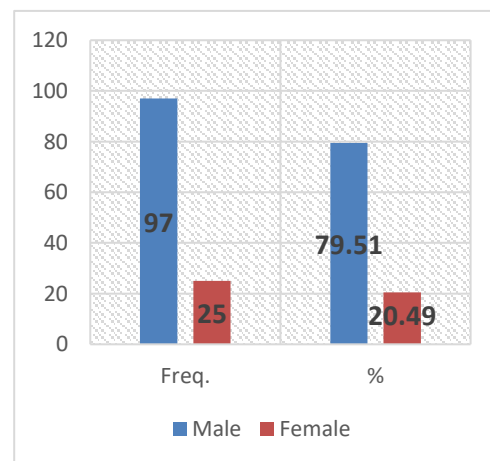
Description of the Socio-Economic and Demographic Variables

The socio-economic and demographics of the respondents is described in line with the distribution of sex, marital status, and educational level of the respondents. In sum, a total of one-hundred and twenty-two (122) respondents were sampled and data is analysed across the eight (8) selected enterprises; and presented in table 2 in appendix 2, and fig. 2 below. Information presented suggests a preponderance of male participation in intervention activities comprising 79.51 percent against female respondents at 20.49 percent. Thus, the skewed representation could be ascribed to the culture of male domination of socio – economic activities in the entire northern region of Nigeria.

The distribution of marital status (table 3, appendix 3) indicates that majority of the respondents are married monogamous (48.36%). This is followed by respondents who are single (21.97%), married polygamous (18.85%) and divorced with only 1 respondent. Evidence indicates that majority of the intervention beneficiaries are married as they represent more than 60 percent of respondents. This is in conformity with the culture of early marriage in the region.

From the distribution of the frequency in table 4, appendix 4 and fig. 3 below, most of the beneficiaries of the intervention have at least acquired formal education. About 74.59 percent of the respondents have tertiary education suggesting that the respondents are reasonably well educated. Equally, from the statistics presented 16.39 percent of respondents have secondary school leaving certificate while 5.74 percent respondents have primary school leaving certificate. Combined, more than 90 percent of the respondents have at least secondary school leaving certificate, indicating that they have the basic education to operate micro enterprises.

Figure 2: Sex distribution of respondents



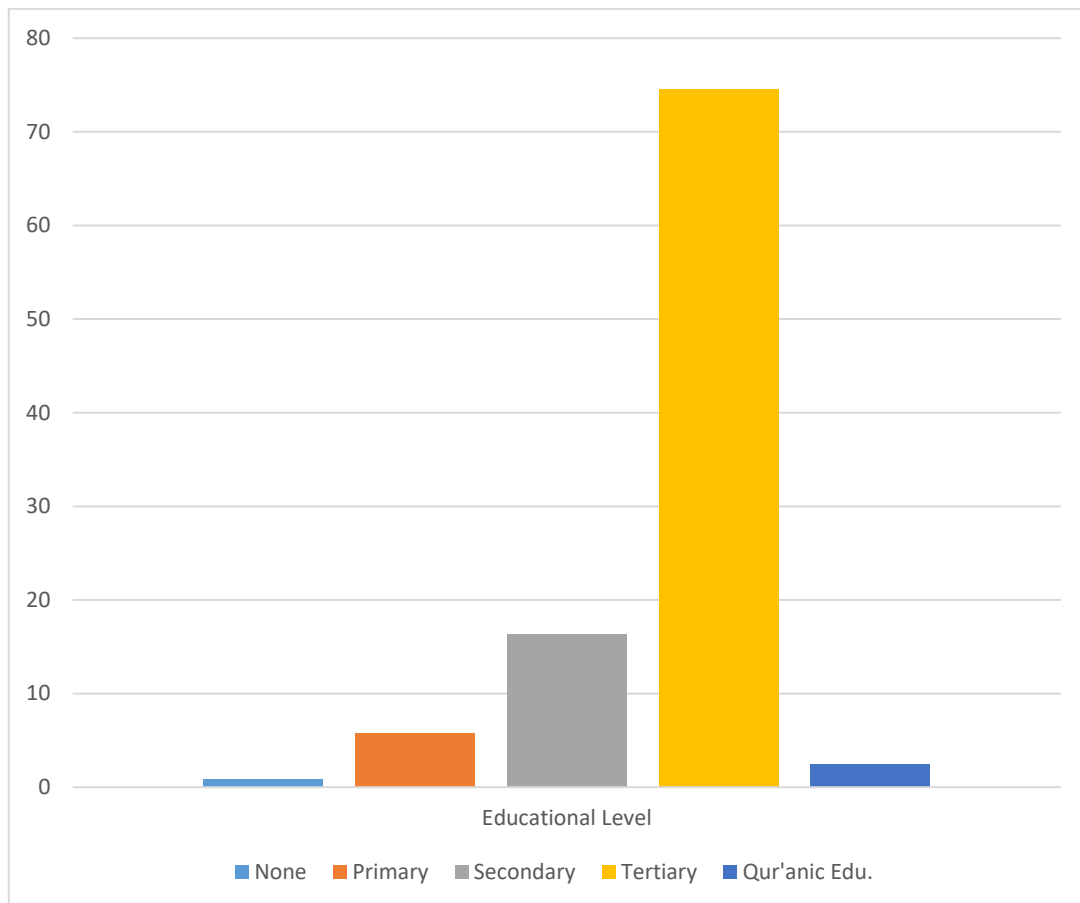


Figure 3: Educational distribution of respondents

Enterprise Cooperative Associations

Among the Borno youth agripreneurs about eight cooperative associations formed along product lines, including grains production/farming and marketing, grains processing and feed milling, poultry production, animal fattening, fish farming and marketing, input supply, and spray service providers (SSPs).

Exploring the benefits of cooperative society among the entrepreneurs, we see that members do enjoy some advantages. Figure 4 (appendix 5) illustrates the distribution of the benefits across the respondents. We analyze the benefits of the cooperative societies among the entrepreneurs from the eight selected agribusiness. We also explore the benefits across male and female entrepreneurs and investigate whether there is any statistically significant inference. Figure 5 (appendix 6) represent the findings of the analysis. From the figure, it could be seen that about 88 respondents claim that business advisory service is the main benefits they derive from being a member of the cooperative society. In another dimension, 56, 53 and 44 respondents, respectively, represent the proportion of the respondents who assert that the collective input procurement, cooperative savings and collective marketing are the benefits of being members of their cooperative societies.

Furthermore, from figures 4 and 5, we can see that there is no statistically significant difference between male and female derivable benefits. It can therefore be deduced that internal savings

and perhaps loan benefits seem to be the main advantage for participating in cooperative societies for both male and female entrepreneurs.

Performance of the Enterprises: Profitability, Employment Generation. Livelihood improvement and Enterprise sustainability

In this section, we aim to give account of the performance of selected enterprises that were established through the intervention. Thus, on the basis of the data collected, we identify the enterprises' performance on the profit levels, job creation, livelihood index, and business sustainability. The distribution of the respondents across selected enterprises is given in table 5 (appendix 7). From the table, grain production/farming and marketing is the highest agribusiness group with a total of 61 respondents representing 46 males (75.41%) and 15 females (24.59%). This is followed by animal fattening comprising of 48 respondents with 40 males (83.33%) and 8 females (16.67%), spray service providers (SSPs) with 36 males (97.30%) and 1 female (2.70%), and poultry production with 11 males (57.89%) and 8 females (42.11%). As a rule, female participants are not encouraged to engage in spray service provision because of reproductive health hazards.

The overall test of significance is established by conducting Pearson's chi-squared and likelihood ratio test which revealed that the two test reject the null hypothesis. This implies that there is statistically significant difference between the male and female participation across different enterprises in the study.

We further analyze opinions of the respondents on the assessment of the operating profit level from 2015 - 2018. The distribution of the assessment is given in table 7.

Table 7: Assessment of operating profit from 2015 - 2018

Operating Profit	Frequency	Percentage (%)
Significantly Increase	95	77.87
Fairly Increase	22	18.03
Unchanged	4	3.28
Fairly Decrease	1	0.82
Total	122	100.00

From table 7, Ninety five (95) respondents (77.87%) assert that their operating profit has "significantly increased", 22 respondents (18.03%) believe that their profit level from 2015-2018 (since the intervention) has just "fairly increased". This shows that, on the average, most of the agripreneurs performed well in terms of profitability. Distribution of respondents by profit level is shown in figure 7 (appendix 8).

The figure indicates that the prospect of agripreneurs who have received the intervention remains bright as 96 percent of respondents are optimistic about their performance and accordingly their future prospects. It also implies that the remaining 4% of the respondents who are not optimistic of their profit level are participants of interest that should be further engaged as to explore the nature of their problems.

We also investigate reasons responsible for the profit level perception among the agripreneurs in the areas of intervention and summarize the statistics in table 6 (appendix 9) with visual interpretation in figure 8 below.

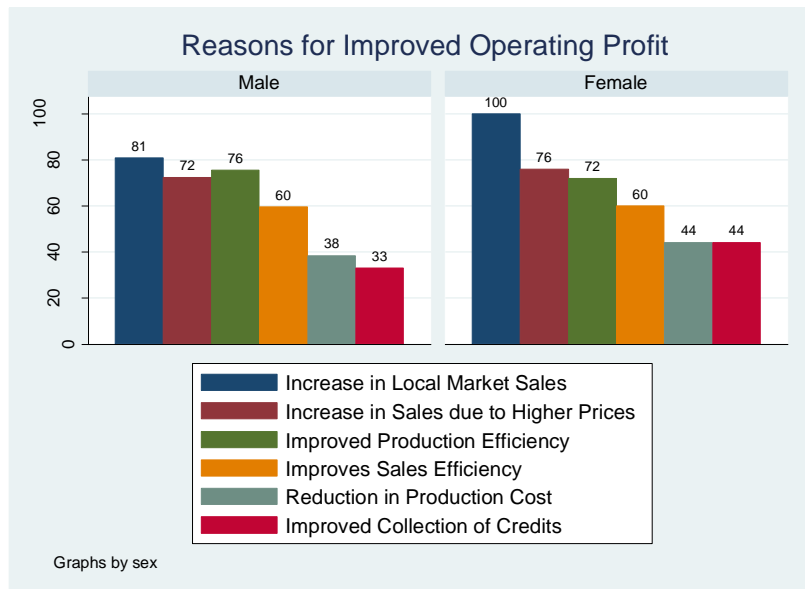


Figure 8: Factors for Improved Profit Levels by sex

From the summary statistics in table 6, it could be inferred that the most important reason that is responsible for the improved profit level across the agripreneurs/enterprises is increase in local market sales for both male (75.25%) and female entrepreneurs (24.75%) respectively. This is followed by improved production efficiency attained by the entrepreneurs which could be directly attributed to the improved capacity and technologies introduced through intervention activities, at males (79.78%) and females (20.22%). Other important factors explaining reasons for improved profit level include, increase in sales with higher prices, reduction in production costs, and improved credit collection. In sum, evidence from the Pearson's chi-squared and likelihood-ratio tests suggests that the differences in the opinions of male and female participants are not statistically significant at all levels.

Accordingly, as revealed in figure 8, the factors prevailing for the improved profit level by male and female agripreneurs exhibit similar pattern. In each category, increase in local market sales remain the dominant drive towards sustaining higher profit among the respondents. Although there are some numerical differences between male and female participants, there is no sufficient evidence to indicate statistical significance based on the estimate of the hypothesis statistic.

Job creation dimension

In terms of the agripreneurs' trend of job creation or employees (casual and permanent), it is observed that there is a significant increase in the number of employees, although mostly casuals, in most of the selected entrepreneurs/enterprises of the study.

Accordingly, from the statistics presented in table 7 (appendix 10), two categories of respondents, 57.38 percent and 33.61 percent, claimed that the changes in number of casual employees "significantly increased" and "fairly increased" respectively between 2014 to 2018. This suggests that more than 90% of the respondents have recorded increase in the number of

their casual staff in their respective enterprises. Equally, in the case of the changes in the number of permanent employees within the same period, presented in table 8 (appendix 11), 44.26% and 14.75% represent the proportion of respondents that admitted that changes in their permanent employees has “significantly increased” and “fairly increased” respectively. In sum, the agripreneurs can be said to have generated substantial (casual and permanent) job opportunities within the period of study (2014-2018) as a result of the intervention. This further suggests that the growth dimensions of the agripreneurs have significantly increased which will subsequently translate into increased income generation, and hopefully improved livelihood among the entrepreneurs. This point is buttressed by the pictogram displayed in figures 9 and 10 for casual and permanent employees respectively.

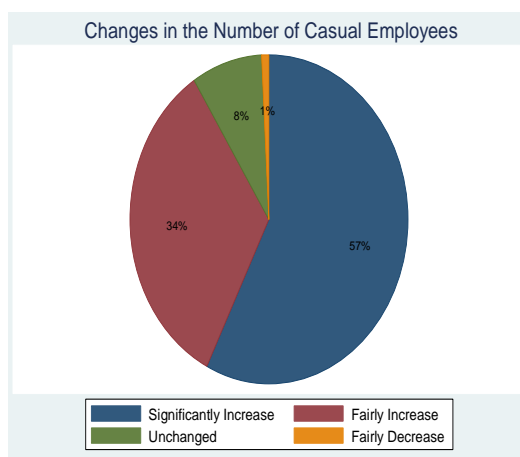


Figure 9: Changes in the Casual Employees

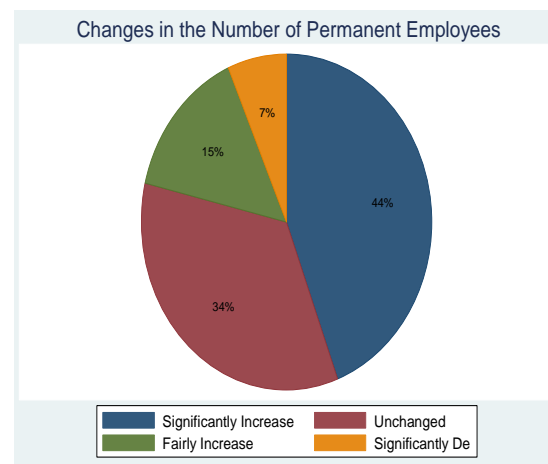


Figure 10: Changes in the permanent employees

Financial Literacy and Access to finance

It is imperative that the research is able to explore the link between business performance, growth dimensions and finances. Financial and Economic literacy in the study is measured through number of respondents operating bank accounts and financial institutions used. It was revealed that about 97 percent of the respondents operate bank accounts with 93 males and 25 females, while only 4 males are without bank account and no female in this category ref. table 9 (appendix 12). This suggests that the agripreneurs are financially literate and linked with the financial sector. In table 10 (appendix 13), we further disaggregate the respondents who operate bank accounts according to the type of financial institution. It is discovered that the 117 respondents use commercial banks with only 1 using cooperative bank. All female agripreneurs use commercial banks within the sampled study.

We also explore the level of access to finance through the possibility that a particular agripreneur has applied to access loan for his/her enterprises from any financial institution and the outcome. This is to reveal the distribution of the agripreneurs who try to access funds from financial institutions. Table 11 (appendix 14) showed that only 36 respondents applied for loans of which 30 are males (83.33%) and 6 are females (16.67%) while 86 respondents claim that they have never applied for loans in the bank. The latter category consists of 67 males (77.91%) and 19

females (22.09%). We further analyze the main factors why such large number of respondents have never applied for loans from financial institutions. Table 12 (appendix 15) report the distributions across male and female agripreneurs.

From the table we can infer that the fear of high interest rate is the greatest factor militating against bank loan applications by the agripreneurs because 71 respondents, 76.06 percent male and 23.94 percent female agreed to this. Equally, 36 respondents, 31 male (86.11%) and 5 female (13.89%), represent the opinions that cumbersome procedures play some roles in denying them access to credits. Short repayment period and high collateral demands are other problems hindering strong linkage between agripreneurs and the financial sector as revealed in the study area (figure 11 below).

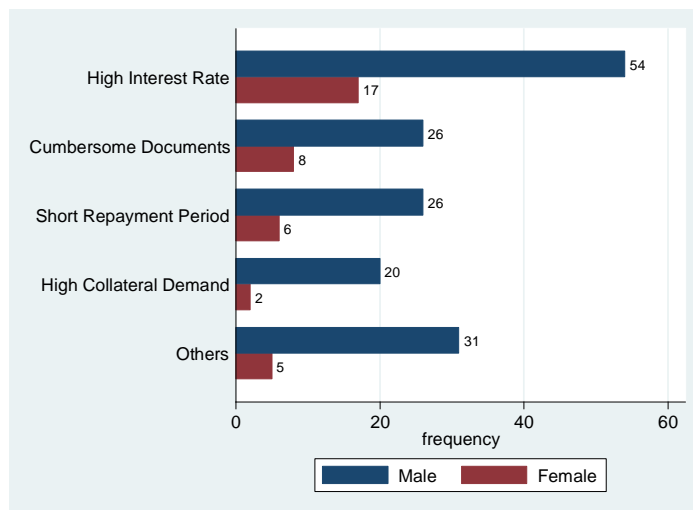


Figure 11: Reasons militating against loan applications and access to finance by agripreneurs/entrepreneurs

Livelihood Index of the Entrepreneurs

In this section, we sought to learn from data the livelihood dynamics of the entrepreneurs as a result of N2Africa youth agripreneurship intervention. Thus, questions raised on understanding livelihoods were analysed and reported accordingly.

Therefore, we see, from table 13 (appendix 16), that about 120 (98.36%) of the respondents believe that their economic situation has significantly improved after the intervention. When we further disaggregate the analysis by sex in table 14 (appendix 17), we see that 95 males (79.17%) and 25 females (20.83%) also concur. In sum, we can say that the intervention has supported the agripreneurs/entrepreneurs to have had significant changes in their economic wellbeing, and livelihood aspirations.

Evaluating the key change parameters in the life and livelihood of the agripreneurs, we illustrate the results in table 15 (appendix 18). From the table, it can be deduced that improved well-being (in terms of improved capacity to access education and health facilities) is the most important indicator of the changes in the life of the beneficiaries as a result of the intervention. This is seen as the statistics from the table indicate that 94 males (78.99%) and 25 females (21.01%) believe that their welfare have improved in terms of ability to pay for basic facilities such as education and health. This is followed by respondents who affirmed that increased income is another

significant change in their life after being beneficiaries of N2Africa Borno youth agripreneurship scheme. As observed from table 15, there are 94 males (80.34%) and 23 females (19.66%) who claimed to have had higher level of income after the intervention. Figure 12 below speaks.

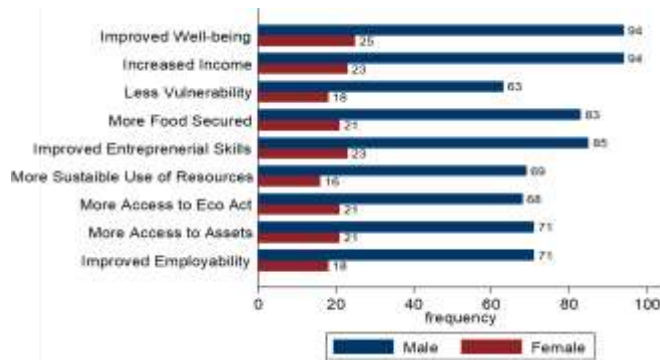


Figure 12: Indicators of changes in the livelihood of youth agripreneurs

Assessing key challenges of the agripreneurs

To account for the challenges facing the agripreneurs is another fundamental objective of this research. Thus, we did a detailed analysis of the identified problems as well as the weaknesses of the enterprises in the study. We analysed different challenges facing the agribusinesses in sales, finance, production, and marketing. We generated cross tabulation in order to expose these problems across the enterprise and present the result in table 16 (appendix 19). From the table, on average, there is no statistically significant differences between the opinion of male and female agripreneurs as the Pearson's chi-squared statistic and likelihood ratio tests indicate high probability value. We therefore conclude that the major problems facing agribusiness in the study environment is inadequate access to finance, market instability, price fluctuations, dilapidating infrastructure, like roads, and generally low volume of economic activities which is attributable to the persistent conflict and instability in the North-East states of Nigeria.

Assessing the Long-term Sustainability of the Intervention

Experience over time has shown that many intervention agencies often face a number of challenges keeping youth engaged and focussed beyond the active intervention period. It is therefore one of the aims of this study to establish the long run sustainability probability and implications of the interventions after the exit of N2Africa project. Thus, we raised questions on perceptions of the respondents concerning the sustainability as well as long term impact of the intervention to the beneficiaries. We use 5-point Likert scale to determine the perception and opinions of the agripreneurs. The results are reported in the following tables.¹ (Tables 17 – 26) appendix 20.

From the information presented in figure 13 (appendix 21), we can conveniently conclude that the intervention has high likelihood of being sustained by the established agribusiness enterprises with possible long run implications that have positive impact on the growth of the businesses. 77.87% of the respondents believe that the experience of the intervention is positive

¹ 1=Strongly Disagree; 2 =Disagree; 3 =Neutral; 4 =Agree; 5=Strongly Agree.

while 78.69% of the respondents strongly agree that there is improved entrepreneurial capacity after the intervention. Equally, from the same figure, we observed that application of innovative technologies is wholly agreed by almost all the sampled respondents as 94 respondents (77.05%) and 27 (22.13%) strongly agree and agreed respectively.

55.74% and 42.62% of the respondents respectively strongly agreed and agreed that they have been able to establish a strong linkage with input and output markets during the intervention, more than 86% (53.28% and 33.61%) have direct interaction with financial institutions despite identified institutional challenges. 119 (97%) of the respondents attest to having the capacity as a result of the intervention, to provide mentorship service in their communities for upcoming enterprises and young entrepreneurs.

Notwithstanding, because of the fact that N2Africa project phase II actually moved from proof of concept to emphasise institutionalisation and sustainability, structures were consciously put in place by the Borno team to ensure that the youth agribusiness initiative survives beyond the project's exit. Some of the frameworks include; Corporate Affairs Commission (CAC) certificate of business registration (CRBN) for all Agripreneurs, Federal Ministry of Industry, Trade and Investment trade mark approvals for food processing businesses (e.g. Hannbeyo peanut and Confiado Oil). This will enhance the acceptability, marketability, and hence profitability of the businesses. Registration of cooperative associations under the various value chain groups with bank accounts, established social networking platforms, and established administrative offices in Biu (Southern Borno) and Maiduguri (Northern Borno) are all part of the sustainability structures in place in the twilight of N2Africa Borno project.

Lessons learned

Operational lessons learned under the intervention include that:

- (a) Effective targeting of participants is germane, to adequately take cognisance of inclusion error (defined as the proportion of participants that are not in the target population e.g. are not youth, or youth that are already gainfully engaged), and exclusion error (defined as the proportion of the target population that are not benefitting from the project).
- (b) Understanding and appreciation of the principles of agricultural value chain is key to the identification of viable business opportunities in the agri-foods system.
- (c) Provision of tangible starter pack soon after training is critical to business take-off while access to credit is important to growing the businesses.
- (d) Women are good entrepreneurs and enterprise leaders if adequately mobilised.
- (e) Youth of non-agricultural background could be productive and earn good income and livelihood in the sector if properly motivated.
- (f) Mind-set re-orientation towards agriculture and agribusiness is important among the youth.
- (g) There is ample Research for Development (R4D) opportunities within the scheme that can conveniently position the activity within the CGIAR system.
- (h) Need for caution in scaling out because of the lingering issue of insurgency. There is a constant perception of insecurity due to frequent terrorists' attacks in communities around the project action areas.
- (i) Rural-based youth seems to be better positioned to succeed in agriculture for livelihood due to primordial attachment to farming, access to land, less distraction, and more commitment.

Conclusion

Stark socio-economic realities are beginning to corroborate the seriousness in the multiplicity of calls for youth engagement in agribusiness, suggesting that the engagement of youth in agricultural value chain and entrepreneurship is likely the panacea out of hunger and poverty in sub Saharan Africa. In Borno State, north-east Nigeria; particularly around the N2Africa action areas, evidence abound to show that young men and women, on account of the intervention, are beginning to embrace agriculture as an income generating activity for a decent livelihood, against the lure of insurgency. Consequently, N2Africa Borno Youth Agripreneurship (BYAP) scheme, and indeed the umbrella IITA Youth Agripreneurs (IYA) initiative, is fast becoming a veritable testament to the fact that; with the right institutional support, training, mentorship and funding, African youth population could be productively engaged in agricultural value chains toward sustainable livelihoods in agribusiness.

Following from our experience therefore, we submit that the growing attention on youth in agribusiness initiatives is a welcome development, and that increased and consistent interventions with appropriate policy modifications are likely to produce desired effects. Current attempts to mainstream youth agripreneurship in international agricultural research for development activities are also steps in the right direction.

ACKNOWLEDGEMENT

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REFERENCES

- AGRA. (2015). AGRA's approach in empowering youth for agricultural transformation www.agra.org
- Federal Republic of Nigeria (FGN). (2009). Second National Youth Policy Document of the Federal Republic of Nigeria 2009.
- FGN (Federal Republic of Nigeria). (2008). Federal ministry of agriculture and water resources (FMAWR): National food security programme (NFSP).
- Filmer D, Fox L, Brooks K, et al., (2014). Youth employment in sub – Saharan Africa. Washington, DC. World Bank and Agence Francaise de Development.
- GIZ. (2017). The voice of Africa's rural youth "La voix de la jeunesse rurale africaine" : analysis of a survey in 21 SSA countries
- IFAD. (2012). Cited in IFPRI food security portal www.ifpri.org
- IITA Youth Agripreneurs (IYA). (2016). Agriculture is the future. October 2016 special issue. Monthly bulletin.
- International Labour Organization. (2012).The youth employment crisis: A call for action. Conclusions from the 101st session of the International Labour Conference. Geneva: ILO.
- Lin, J. (2012). "Youth bulge: A demographic dividend or a demographic bomb in developing countries?" World Bank, Washington, D.C
- Losch, B. (2016). Structural transformation to boost youth labour demand in sub – Saharan Africa: the role of agriculture, rural areas and territorial development. Employment working paper No. 204 ILO, Geneva.
- N2Africa. (2016). Youth engagement in entrepreneurship and sustainable livelihood in agricultural value chain. N2Africa Borno State Project, Nigeria, IITA. 10pp. ISBN 978-978-8444-71-1
- Sumberg J, Ripoll S, Anderson J, et al., (2017). Rural transformation, cereals and youth in Africa: what role for international agricultural research? Outlook on Agriculture 1 – 10. DOI: 10.1177/10030727017724669
- USAID. (2012a). Youth in development: Realizing the demographic opportunity. Washington, DC
- USAID. (2014). Youth engagement in development: effective approaches and action-oriented recommendations for the field
- Woomer, P. L., Huising, J., Giller, K. E. et al; (2014). N2Africa final report of the first phase 2009-2013, www.N2Africa.org, 138 pp.

Appendix

Appendix 1: Borno Youth Agripreneurs (BYAP) scheme implementation flow chart

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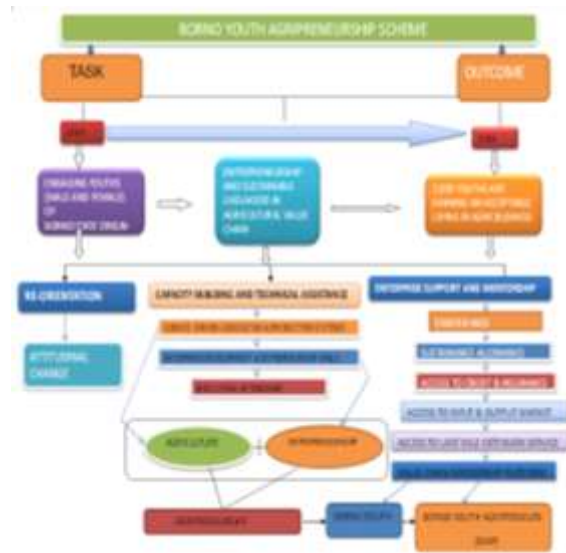


Figure 1: Borno Youth Agripreneurs (BYAP) scheme implementation flow chart
Source: IITA/N2Africa Borno State project

Appendix 2: Sex Distribution of Respondents

Table 2: Sex Distribution of Respondents			
Sex	Freq.	Percent	Cum.
Male	97	79.51	79.51
Female	25	20.49	100.00
Total	122	100.00	

Appendix 3: Marital Status of the Respondents

Table 3: Marital Status of the Respondents			
Marital status	Freq.	Percent	Cum.
Married Monogamous	59	48.36	48.36
Married Polygamous	23	18.85	67.21
Single	39	31.97	99.18
Divorced	1	0.82	100.00
Total	122	100.00	

Appendix 4: Educational Qualification of Respondents

Table 4: Educational Qualification of the Respondents			
Educational Level	Freq.	Percent	Cum.
None	1	0.82	0.82
Primary School	7	5.74	6.56
Secondary School	20	16.39	22.95
Tertiary	91	74.59	97.54
Qur'anic Education	3	2.46	100.00

Total	122	100.00
-------	-----	--------

Appendix 5: Cooperative benefits among the Entrepreneurs

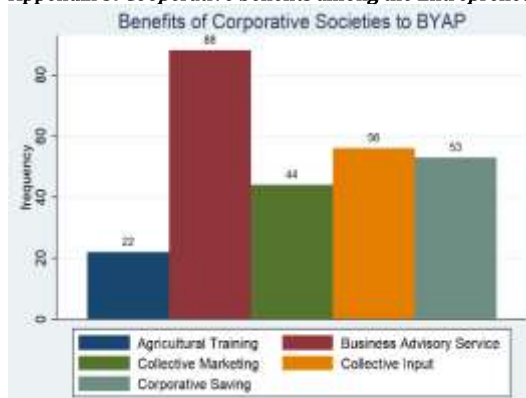


Figure 4: Cooperative benefits among the Entrepreneurs

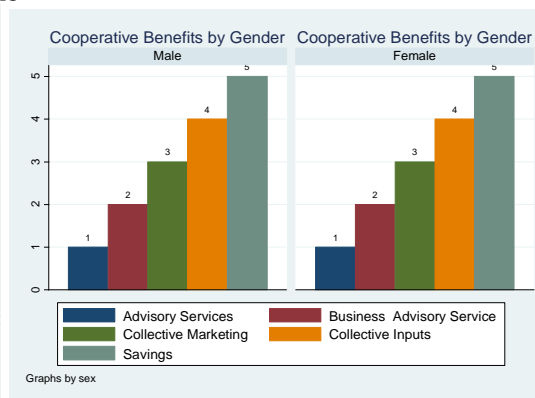


Figure 5: Cooperative benefits by Gender among the Entrepreneurs

Appendix 7: Distribution of Respondents across Enterprises

Table 5: Distribution of the Respondents across Enterprises

Enterprises	Sex		Total	chi2/p*
	Male	Female		
Grain Prod.	46	15	61	1.258
	75.41	24.59	100.00	1.000
	47.42	60.00	50.00	
Animal Fatt.	40	8	48	0.711
	83.33	16.67	100.00	1.000
	41.24	32.00	39.34	
Spray Serv P	36	1	37	10.315
	97.30	2.70	100.00	0.011
	37.11	4.00	30.33	
Poultry Pro	11	8	19	6.453
	57.89	42.11	100.00	0.089
	11.34	32.00	15.57	
Input Suppl	11	8	19	6.453
	57.89	42.11	100.00	0.089
	11.34	32.00	15.57	
Fish Farmg	4	0	4	1.066
	100.00	0.00	100.00	1.000
	4.12	0.00	3.28	
Grain Proc	1	0	1	0.260
	100.00	0.00	100.00	1.000
	1.03	0.00	0.82	

Local Fabri	1	0	1	0.260
	100.00	0.00	100.00	1.000
	1.03	0.00	0.82	
-----+-----				
Total	150	40	190	
	78.95	21.05	100.00	
	154.64	160.00	155.74	
Cases	97	25	122	
Overall Test(s) of Significance:				
Pearson chi2(21) = 46.4328 Pr = 0.001				
likelihood-ratio chi2(21) = 52.0626 Pr = 0.000				

Appendix 7: Distribution of Respondents across Enterprises by sex

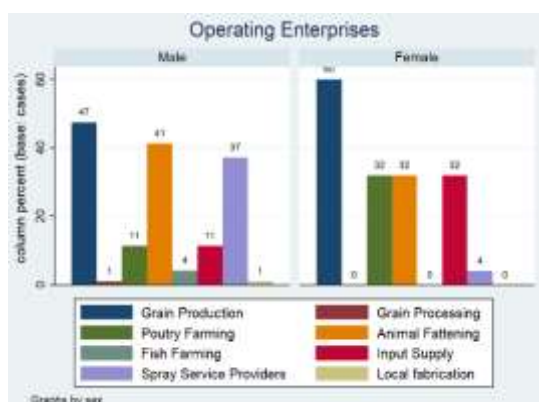


Figure 6: Distribution of the Respondents across the Enterprises by sex

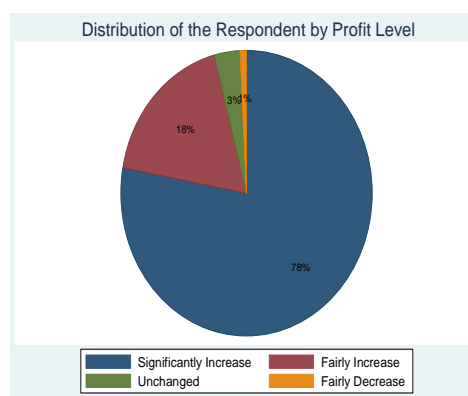


Figure 7: Operating Profit Level

Appendix 9: Reasons for Improved Profit Level

Table 6: Reasons for Improved Profit Level

	Sex			
Improved Pr	Male	Female	Total	chi2/p*
-----+-----				
Mkt Sales	76	25	101	5.640
	75.25	24.75	100.00	0.105
	80.85	100.00	84.87	
-----+-----				
Prod Effi.	71	18	89	0.131
	79.78	20.22	100.00	1.000
	75.53	72.00	74.79	
-----+-----				
Sales Price	68	19	87	0.135
	78.16	21.84	100.00	1.000
	72.34	76.00	73.11	
-----+-----				
Sales Effi.	56	15	71	0.001
	78.87	21.13	100.00	1.000

	59.57	60.00		59.66		
-----+-----+-----						
Prod Cost		36	11		47	0.269
	76.60	23.40		100.00	1.000	
	38.30	44.00		39.50		
-----+-----+-----						
Coll Credit		31	11		42	1.050
	73.81	26.19		100.00	1.000	
	32.98	44.00		35.29		
-----+-----+-----						
Total		338	99		437	
	77.35	22.65		100.00		
	359.57	396.00		367.23		
Cases		94	25		119	
Overall Test(s) of Significance:						
Pearson chi2(26) = 22.2929 Pr = 0.673						
likelihood-ratio chi2(26) = 26.4219 Pr = 0.440						

Appendix 10: Trend in the Number of Casual Employees

Table 7: Changes in the Number of Casual Employees

Changes Casual Employ.	Freq.	Percent	Cum.	
-----+-----				
Significantly Increase		70	57.38	57.38
Fairly Increase		41	33.61	90.98
Unchanged		10	8.20	99.18
Fairly Decrease		1	0.82	100.00
-----+-----				
Total		122	100.00	

Appendix 11: Trend in the Number of Permanent Employees

Table 8: Changes in the Number of Permanent Employees

Changes permanent Empl	Freq.	Percent	Cum.	
-----+-----				
Significantly Increase		54	44.26	44.26
Fairly Increase		18	14.75	59.02
Unchanged		42	34.43	93.44
Significantly Decrease		8	6.56	100.00
-----+-----				
Total		122	100.00	

Appendix 12: Distribution of Respondents Operating Bank Account

Table 9: Distribution of the Respondent Operating Bank Account

/	Sex
/	Male Female Percent Total

-----+-----				
Yes/	93	25	96.72	118
No/	4	3.28	4	
/				
Total/	97	25	100.00	122
-----+-----				

Appendix 13: Respondents' Financial Institutions by sex

Table 10: Respondents' Financial Institutions by sex

/ Type_of_fin_institution and sex						
/-----Comm Banks-----			-----Coop Banks-----			
/	Male	Female	Total	Male	Female	Total
-----+-----						
Yes/	92	25	117	1	1	
/						
Total/	92	25	117	1	1	
-----+-----						

Appendix 14: Loan Application by sex

Table 11: Loan Application by sex

Application/ sex			
for credit/	Male	Female/	Total
-----+-----			
Yes/	30	6/	36
/	83.33	16.67/	100.00
/	30.93	24.00/	29.51
-----+-----			
No/	67	19/	86
/	77.91	22.09/	100.00
/	69.07	76.00/	70.49
-----+-----			
Total/	97	25/	122
/	79.51	20.49/	100.00
/	100.00	100.00/	100.00

Appendix 15: Reasons militating against loan applications and access to finance by agripreneurs

Table 12: Reasons for Refusal to Apply for Credits

Sex				
Male		Female	Total chi2/p*	
-----+-----				
High	54	17/	71	0.313
Interest	76.06	23.94/	100.00	1.000
Rate	98.18	100.00/	98.61	
-----+-----				
Formalities	31	5/	36	3.773

	86.11	13.89		100.00	0.260
	56.36	29.41		50.00	
-----+-----+-----					
Short		26	8		34 0.000
Period		76.47	23.53		100.00 1.000
	47.27	47.06		47.22	
-----+-----+-----					
High		26	6		32 0.755
Collateral		81.25	18.75		100.00 1.000
	47.27	35.29		44.44	
-----+-----+-----					
Others		20	2		22 3.703
	90.91	9.09		100.00	0.272
	36.36	11.76		30.56	
-----+-----+-----					
Total		157	38		195
	80.51	19.49		100.00	
	285.45	223.53		270.83	
Cases		55	17		72
Overall Test(s) of Significance:					
Pearson chi2(13) = 13.4176 Pr = 0.416					
likelihood-ratio chi2(13) = 16.7231 Pr = 0.212					

Appendix 16: Perception of Agripreneurs Economic Situation as a result of the Intervention

Table 13: Agripreneurs Economic Situation because of the Intervention

<i>overall_eco /</i>				
<i>conomic_situa /</i>				
<i>tion_after_ /</i>				
<i>interventio /</i>				
	<i>n /</i>	<i>Freq.</i>	<i>Percent</i>	<i>Cum.</i>
-----+-----				
<i>Improve</i>		120	98.36	98.36
<i>No Change</i>		1	0.82	99.18
<i>Worsen</i>		1	0.82	100.00
-----+-----				
<i>Total</i>		122	100.00	

Appendix 17: Perception of Agripreneurs Economic Situation as a result of the Intervention by sex

Table 14: Agripreneurs Economic Situation after the Intervention by sex

<i>/ Sex</i>					
<i>/ Male Female / Total</i>					
-----+-----					
<i>Improve</i>		95	25		120
	79.17	20.83		100.00	
	97.94	100.00		98.36	

-----+-----+-----			
No Change	1	0	1
	100.00	0.00	100.00
	1.03	0.00	0.82
-----+-----+-----			
Worsen	1	0	1
	100.00	0.00	100.00
	1.03	0.00	0.82
-----+-----+-----			
Total	97	25	122
	79.51	20.49	100.00
	100.00	100.00	100.00
-----+-----+-----			
Pearson chi2(2) = 0.5241 Pr = 0.769			

Appendix 18: Change Indicators of the agripreneurs Livelihood as a result of the intervention

Table 15: Change Indicators of the agripreneurs Livelihood as a result of the intervention

Sex				
Male Female Total chi2/p*				
-----+-----+-----				
Improved	94	25	119	0.793
Well-being	78.99	21.01	100.00	1.000
	96.91	100.00	97.54	
-----+-----+-----				
Increased	94	23	117	1.218
Income	80.34	19.66	100.00	1.000
	96.91	92.00	95.90	
-----+-----+-----				
Improved	85	23	108	0.374
Entp Skills	78.70	21.30	100.00	1.000
	87.63	92.00	88.52	
-----+-----+-----				
More Food	83	21	104	0.039
Secured	79.81	20.19	100.00	1.000
	85.57	84.00	85.25	
-----+-----+-----				
More Access	71	21	92	1.251
To Assests	77.17	22.83	100.00	1.000
	73.20	84.00	75.41	
-----+-----+-----				
More Access	68	21	89	1.945
Eco Act	76.40	23.60	100.00	1.000
	70.10	84.00	72.95	
-----+-----+-----				
Improved	71	18	89	0.014

<i>Employability</i>	79.78	20.22	100.00	1.000
	73.20	72.00	72.95	
-----+-----+-----				
<i>More</i>	69	16	85	0.479
<i>Sustainable</i>	81.18	18.82	100.00	1.000
<i>Use of Res</i>	71.13	64.00	69.67	
-----+-----+-----				
<i>Less</i>	63	18	81	0.443
<i>Vulnerable</i>	77.78	22.22	100.00	1.000
	64.95	72.00	66.39	
-----+-----+-----				
<i>Total</i>	698	186	884	
	78.96	21.04	100.00	
	719.59	744.00	724.59	
<i>Cases</i>	97	25	122	
<i>Overall Test(s) of Significance:</i>				
<i>Pearson chi2(31) = 37.8985 Pr = 0.184</i>				
<i>likelihood-ratio chi2(31) = 38.5730 Pr = 0.164</i>				

Appendix 19: Identified challenges of agripreneurs

Table 16: Identified challenges of agripreneurs

	Sex		Total	chi2/p*
	Male	Female		
-----+-----+-----				
<i>Sluggish</i>	77	23	100	1.612
<i>Eco Act</i>	77.00	23.00	100.00	1.000
	86.52	95.83	88.50	
-----+-----+-----				
<i>Decrease in</i>	43	18	61	5.419
<i>Market Sale</i>	70.49	29.51	100.00	0.139
	48.31	75.00	53.98	
-----+-----+-----				
<i>Insecurity</i>	32	11	43	0.782
	74.42	25.58	100.00	1.000
	35.96	45.83	38.05	
-----+-----+-----				
<i>Poor Inf</i>	23	11	34	3.591
<i>Inst</i>	67.65	32.35	100.00	0.407
	25.84	45.83	30.09	
-----+-----+-----				
<i>Limited</i>	17	6	23	0.406
<i>Clients</i>	73.91	26.09	100.00	1.000
	19.10	25.00	20.35	
-----+-----+-----				
<i>Limited</i>	17	6	23	0.406
<i>Patronage</i>	73.91	26.09	100.00	1.000

		19.10	25.00		20.35	
-----+-----+-----						
Poor Bus		17	5		22	0.036
Regulation		77.27	22.73		100.00	1.000
		19.10	20.83		19.47	
-----+-----+-----						
Total		226	80		306	
		73.86	26.14		100.00	
		253.93	333.33		270.80	
Cases		89	24		113	
Overall Test(s) of Significance:						
Pearson chi2(40) = 37.4780 Pr = 0.584						
likelihood-ratio chi2(40) = 40.3456 Pr = 0.455						

Appendix 20: Assessing the Long-term Sustainability of the Intervention (The results are reported in the following tables.²)

<i>Table 17: Positive Overall Experience of the Intervention</i>				
		Freq.	Percent	Cum.
-----+-----				
1		4	3.28	3.28
4		23	18.85	22.13
5		95	77.87	100.00
-----+-----				
Total		122	100.00	

<i>Table 18: Improved Entrepreneurial Capacity</i>				
		Freq.	Percent	Cum.
-----+-----				
1		2	1.64	1.64
3		1	0.82	2.46
4		23	18.85	21.31
5		96	78.69	100.00
-----+-----				
Total		122	100.00	

<i>Table 19: Application of the Innovative Technologies in the Agribusiness</i>				
		Freq.	Percent	Cum.
-----+-----				
1		1	0.82	0.82
4		27	22.13	22.95
5		94	77.05	100.00
-----+-----				
Total		122	100.00	

<i>Table 20: Sharing of Knowledge with Colleagues</i>				
		Freq.	Percent	Cum.
-----+-----				

² 1=Strongly Disagree; 2 =Disagree; 3 =Neutral; 4 =Agree; 5=Strongly Agree

2	1	0.82	0.82
4	27	22.13	22.95
5	94	77.05	100.00
-----+-----			
Total	122	100.00	

Table 21: Independent Use of the Acquired Knowledge

	Freq.	Percent	Cum.
-----+-----			
1	1	0.82	0.82
4	25	20.49	21.31
5	96	78.69	100.00
-----+-----			
Total	122	100.00	

Table 22: Sustained Knowledge Acquired in the Future

	Freq.	Percent	Cum.
-----+-----			
1	1	0.82	0.82
4	32	26.23	27.05
5	89	72.95	100.00
-----+-----			
Total	122	100.00	

Table 23: Strong Future of the Enterprise

	Freq.	Percent	Cum.
-----+-----			
1	1	0.82	0.82
4	29	23.77	24.59
5	92	75.41	100.00
-----+-----			
Total	122	100.00	

Table 24: Sustainable Linkages with Input and Output Markets

	Freq.	Percent	Cum.
-----+-----			
1	1	0.82	0.82
3	1	0.82	1.64
4	52	42.62	44.26
5	68	55.74	100.00
-----+-----			
Total	122	100.00	

Table 25: Direct Interaction with Financial Institutions

	Freq.	Percent	Cum.
-----+-----			
1	1	0.82	0.82
2	8	6.56	7.38
3	7	5.74	13.11
4	41	33.61	46.72

5	65	53.28	100.00
-----+			
Total	122	100.00	

Table 26: Mentorship in the Community

	Freq.	Percent	Cum.
-----+			
1	1	0.82	0.82
3	2	1.64	2.46
4	32	26.23	28.69
5	87	71.31	100.00
-----+			
Total	122	100.00	

Appendix 21: Assessing the Long-term sustainability of the intervention

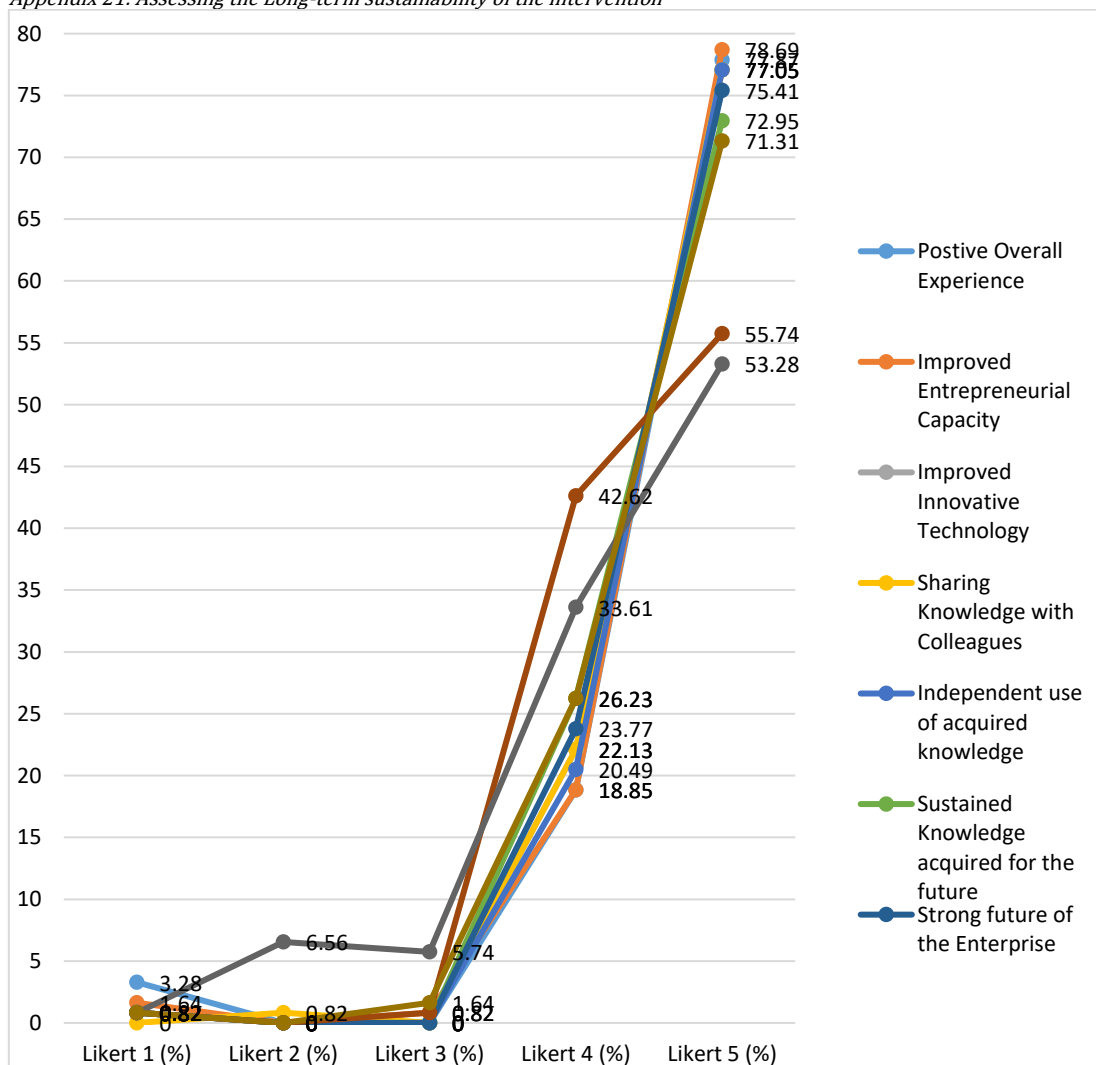


Figure 20: Assessing the Long-term sustainability of the intervention