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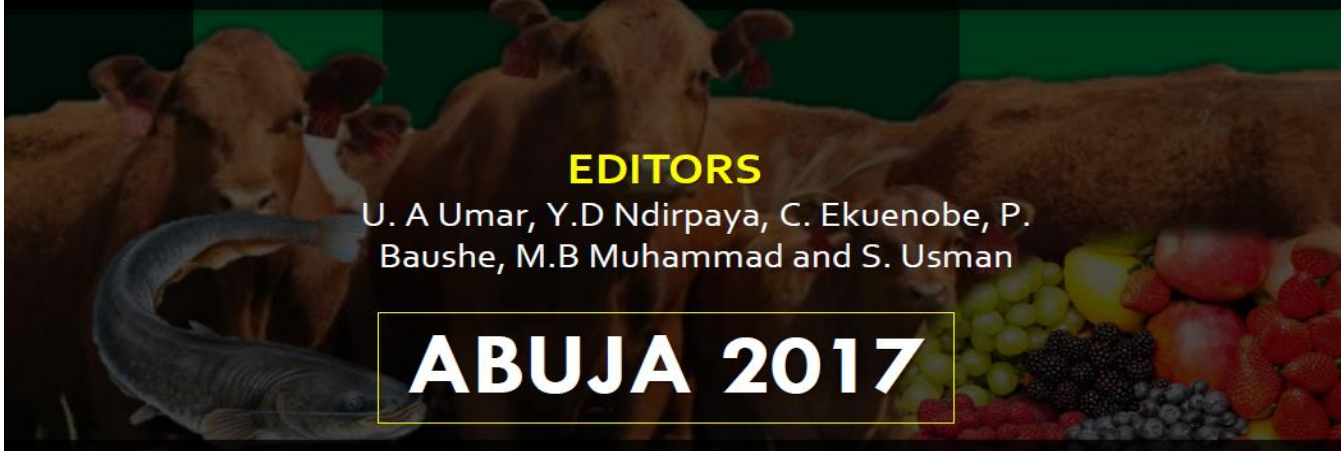
THE GREEN ALTERNATIVE: AGRICULTURE AS ENGINE FOR NIGERIA'S ECONOMIC GROWTH



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AD1 ENHANCING FARMERS' ACCESS TO TECHNOLOGY AND MARKET FOR INCREASED SORGHUM PRODUCTIVITY IN THE SELECTED STAPLE CROP PROCESSING ZONES

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Abstract

The Agricultural Transformation Agenda Support Program Phase 1 (ATASP-1) of the Federal Government of Nigeria was launched in 2015 as a follow up to the previous, Agricultural Transformation Agenda (ATA). It is expected to create in 120,000 jobs along the value chain of priority commodities and add additional 20 million metric tons of food. Project activities included thematic training, on-farm technology demonstrations, community seed production and formation of Innovation Platforms for market linkages. The project has made remarkable progress in enhancing access to quality seeds and other inputs to over 34,300 farmers while expanding knowledge of best-bet production technologies in over 100 communities across three staple crop processing zones (SCPZ). During the 2016 cropping season, farmers produced over 70,268 Mt of grains valued at ₦ 9.135billion (US$29M). The use of improved varieties increased yields by 32%, 42% and 64% in Bida-Badeggi, Kano-Jigawa and Sokoto-Kebbi SCPZ, respectively. Seed dressing increased yields by 38%, 27%, and 30% in the three SCPZs respectively, while tillage practices increased yields by 20% and 55% in Kano - Jigawa and Sokoto - Kebbi SCPZs. Through Innovation Platforms set up with other stakeholders and market linkages to large scale processors, 109.76 tons of seeds were procured and planted. Average yield obtained on the improved technologies was 1.5 t/ha compared to 1.1 t/ha by other farmers giving a 40% increase. A total of 1,093 women farmers comprising of about 34.2% of the total number of participating farmers benefited directly from the project. Seed fairs, rural radios and audio-visual broadcasts on improved sorghum production technologies were used to reach non-participating farmers within the zones.

Introduction

Sorghum [Sorghum bicolor (*L.*) Moench] remains an important food security crop in Sub-Saharan Africa (SSA), especially in the marginal areas where other crops do not do well. Sorghum production in SSA is estimated 26million MT with Nigeria being the leading sorghum, producer in Africa and the second in the world after USA (AATF, 2011). In Nigeria, the bulk of its estimated production of about 8 million tonnes (NAERLS, 1996) is grown in the Northern Guinea and Sudan/Sahel ecologies accounting for about 71% of the total regional sorghum output (Gourichon, 2013). However, the crop is gaining further commercial significance, especially in the malting and brewing industry. The increased use of sorghum for malting has resulted in competition in the market between grain for food and grain for malting purposes. Thus, the potential of sorghum to be the driver of economic development in Africa, particularly Nigeria cannot be over emphasized given the significant benefits to Nigerian farmers and National food security.

Improvement in sorghum productivity will play a critical role in feeding the growing Nigerian population that is expected to double during the next two decades. Therefore, there is a need to support farmers to increase sorghum productivity rather than acreage cultivated, if Nigeria is to meet the shortfall in production. Among the challenges that national policies should address is access to and use of improved technologies. If the negative productivity effects are to be reversed, new and existing technologies must be quickly up-scaled and out-scaled.

Because of scarcity and high cost, most smallholder farmers in tropical Africa rarely use inorganic fertilizers on food crops including sorghum. Subsistence sorghum production in Nigeria is thus

characterized by low external input, low yields, food insecurity, nutrient mining and environmental degradation (Ajeigbe et al 2010). Since a majority of these farmers have low income, technical packages to increase and sustain agricultural production must be affordable, profitable and applicable to ensure their acceptability.

Towards achieving this goal, the Federal Ministry of Agriculture and Rural Development (FMARD) got the backing of the African Development Bank to finance a project on 'Agricultural Transformation Agenda Support Program-phase 1 (ATASP-1)'. This project will be implemented in five years in four Staple Crops Processing Zones (SCPZs) of Adani-Omor, Bida-Badeggi, Kano-Jigawa and Kebbi-Sokoto. Key impacts are additional incomes to an increasing number of producers and entrepreneurs in the sector by the creation of about 120,000 jobs along the value chain of priority commodities; and additional 20 million metric tons of key commodity food crops added to domestic food supply per annum. This paper report some of the progress made by the sorghum outreach program of the ATASP-1 in 2016.

Materials and Methods

It was implemented in over 100 communities across 3 SCPZs comprising Kebbi-Sokoto SCPZ, Kano-Jigawa SCPZ and Bida-Badeggi SCPZ. Based on climate and vegetation of Nigeria, the SCPZ's cut across four agro-ecological zones, which include Sahel, Sudan savanna, Guinea savanna (comprising both Northern and Southern) zones (Akinseye et al., 2012). Participatory Research Extension Aproach (Ajeigbe and Dashiel 2010) on-farm demonstrations were used for the promotion of the adoption of available improved sorghum varieties and best-bet production technologies. Four distinct technologies which include fertilizer management strategy, varietal, seed dressing and tillage practices combined with training of trainers (ToT), extension staff and development agencies, promotion of community-level seed production schemes, and community outreach programs, such as farmers field day, rural radio talk shows.

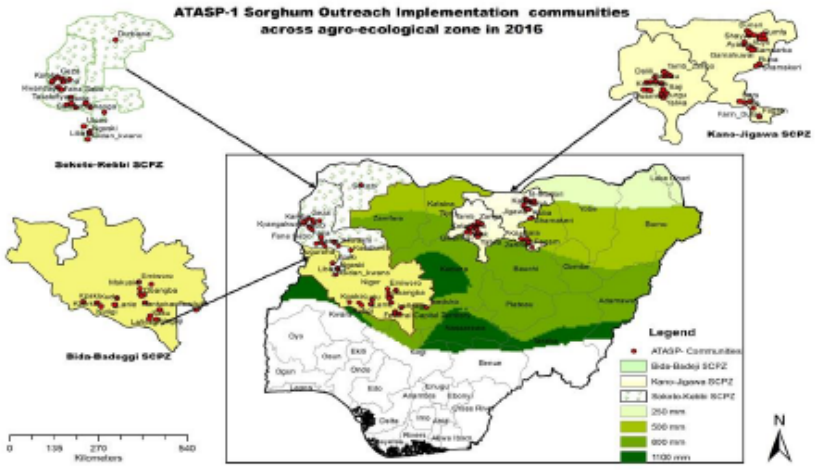

Figure 1: Map of Nigeria showing states and communities across three staple crop processing zones.

Result and Discussion

Village level discussions, revealed that small-holder farmers predominate, such resource-poor farmers have few opportunities to intensify and commercialize their agricultural activities, and have poor access to inputs, markets, low interest credit and poor extension services. Hence, there is little or no adoption of improved production technology and the low yields and rural poverty were further exacerbated. Sorghum commodity crop under ATASP-1 attached a lot of importance to promoting the adoption of improved technologies. The planning sessions across the three sorghum (Kebbi-Sokoto, Kano-Jigawa and Bida-Badeggi SCPZs) helped to strengthen the research-extension-farmer linkage by providing a forum that facilitated contributions from farmers, marketers and technical staff of the various participating organizations. During the planning process, technology gaps were identified and the researchers focused their efforts on filling the gaps.

Table 1. Quantities of breeder, foundation and commercial seed of sorghum distributed by the ATASP-1 across three SCPZs in Nigeria during 2016 cropping season

SCPZ	Breeder seed(kg)	Foundation seed(kg)	Certified/commercial seed (kg)
Kebbi-Sokoto	0	200	24,080
Kano-Jigawa	200	600	51,792
Bida- Badeggi	0	100	33,888
Total	**200**	**900**	**109,760**

Improving farmers' access to quality seed of improved Varieties

Over 34,300 farmers, accessed quality seeds and other inputs through linkages provided by the project. ICRISAT provided training to youths on seed production and also made significant positive impact on the availability of breeder, foundation and certified seeds of improved sorghum varieties for the project (Table 1). In addition, A total of 110 MT of sorghum seeds were distributed to 34,032 benefiting farmers across the participating States, in the 3 SCPZs targeting an estimated sorghum production of 70,267 MT. 32.4% of the profiled sorghum farmers in the project were women. The project promoted 10 sorghum varieties (ICSV-400, ICSV-111, Improved Deko, Zabuwa, CSR 01, CSR 02, Samsorg 44, SK5912 including 2 hybrids CSR 03H, CSR 04H,) with high market demand. These range in maturity from 80 days to 130 days. The Improved Deko and Zabuwa varieties were released to farmers in 2013 by IAR and ICRISAT for its high nutritive content (iron and zinc), drought tolerance and early maturity.

On-farm Technology demonstrations

Through the on-farm demonstrations, four different technology approaches were deployed across 100 communities in the three (3) SCPZs which included best-bet fertilizer management practices, identification of best variety for high yielding and disease tolerant, best seed dressing and tillage practices. The information has been shared among various partners, project beneficiary farmers and farmers who were not directly involved in the project. Table 2, displayed the yield gained across different technologies, the use of improved variety increased grain yield by 32%, 42% and 64% in Bida-Badeggi, Kano-Jigawa and Sokoto-Kebbi SCPZ, respectively. Seed dressing increased grain yield by 38%, 27%, and 30% in the three SCPZs respectively, while tillage practices increased yields by 20% and 55% in Kano - Jigawa and Sokoto - Kebbi SCPZs.

Table 2: Yield gained from Technology deployed across three SCPZ during 2016 cropping season

SCPZ	LGA	Variety Technology		Seed Dressing Techniques		Tillage Technique	
Bida-Badeggi		OPV/Hybrid	Local	Dressed	Undressed	Conventional	Minimum
	Lavun	2143	1480	1700	840		
	Mokwa	1694	1660	2400	1900		
	Agaie	2133	1891	1227	1027		
	Wushishi	1207	580	1100	700		
	Gbako	1297	627	1300	970		
	Katcha	1240	1120	1267	1000		

	Mean yield	**1619**	**1226**	**1499**	**1073**		
	%Yield gained	**32.02**		**39.72**			
Kano-Jigawa	Rano	1438	1080	1190	1078	1152	966
	Bebeji	1521	1247	1537	1136	2399	1905
	Kura	3680	2800	5700	5400	7200	6200
	Bunkure	1771	910	2394	1360	2443	2456
	G/ Mallam	1216	902	2460	1683	1785	1170
	Dawakin Kudu	1508	1391	1438	1006	1895	1640
	Gwaram	890	101	2304	1368	2076	1272
	M/Madori	1124	903	1350	927	1327	837
	Auyo	2227	1300	3200	3150	3500	3100
	K/Hausa	1289	1020	1633	933	1167	733
	Hadejia	861	700	2288	2000	1988	2600
	Mean yield	**1593**	**1123**	**2318**	**1822**	**2448**	**2080**
	%Yield gained	**41.86**		**27.21**		**17.71**	
Sokoto-Kebbi	Dandi	687	456	1800	1584	1060	484
	Ngaski	964	576	2564	2240		
	Bagudo	355	198	780	560	1610	760
	Shanga	760	640	1600	1300		
	Suru	1360	1000	1200	800	1040	800
	Kware	1840	760	3700	2500	2750	2100
	Mean yield	**994**	**605**	**1941**	**1497**	**1615**	**1036**
	%Yield gained	**64.35**		**29.61**		**55.89**	

Conclusion

The implementation of sorghum outreach program of ATASP-1 in 2016 cropping season, has played a catalytic role in the dissemination of improved varieties and production technologies in the country. The promotion and adoption of high yielding, disease and pest-resistant sorghum varieties have resulted in significant sorghum yield increase with a future goal increased at an average yield of 2500kgha^{-1} in all ATASP-1 intervention states in the next three years ahead. Also, the project increased farmers' technical knowledge on good agronomic practices (GAP) for

sorghum production and also strengthened partnerships among farmers' organizations, NARES, the private sector and NGOs.

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