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Evaluation of contributions of technology changes to commercialization among small holder crop Farmers in South East Nigeria.

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ABSTRACT

The study evaluated the contributions of technology changes to commercialization among small holder crop farmers in South East Nigeria. This was carried out using 408 registered farmers. Multistage, purposive, proportionate and random sampling method were used in the selection of Agricultural zones, Local Government Areas and communities for the study. Data were collected on technologies available and products generated. The data were analyzed using descriptive statistics such as frequencies and percentages and net return analysis. The results indicate that the major technologies are improved variety (88%), inorganic fertilizer(65%), rice mill(59%) and gari processing machines (81%).The major products are milled rice, gari and shelled maize. The crops subjected to value addition by processing gave more revenue to the farmer, hence 53% of cassava processed gave additional revenue of ₦138,168.62 to the farmer. There is need to ensure optimum utilization of agricultural produce through effective downstream sector so as to address local and international demand.

1.0 Introduction

In South-East Nigeria, Crops have been subjected to yield enhancing technologies. There seem to be inadequate value addition strategies that would enable farmers benefit more farm increased crop production by minimizing post harvest losses and enhancing commercialization. Post-harvest losses result in less than optimum utilization of farm produce due to inadequate storage facilities, hence sub regional market advantages are not fully exploited (NESG 2004). Many agricultural output are sold in the market with little or no value added (Lundy et al 2004).

The major challenge becomes how to improve value addition capabilities and check post harvest losses so that it does not hamper the bumper harvest obtained from improved input and farm methods. Adequate and appropriate technology is needed to facilitate the use of increased input and transformation of produce generated into competitive forms for the market. The farm household becomes better integrated into the input and output market by increasing the unit of input used and raising the cash earning capacities of the enterprises involved (Abu 2015).

Commercialization is the movement from subsistence production to market based system by increasing the unit of input/output and raising their value.

It becomes imperative to examine the technology changes and evaluate their contributions to commercialization

among crop farmers in south east Nigeria.

2.0 Materials and methods

The study was carried out in South-East comprising Abia, Enugu and Ebonyi State. The area is characterized by tropical climate with distinct rainy season (April to September) and dry season (October to March). The economic activities in the area include farming, civil service and trading. The major cropping system is mixed cropping with cassava, yam, maize and rice as major crops.

Multistage sampling technique was used in the selection of States, Agricultural zones, Local Government Areas (LGAs), Communities and Villages. In the First three stages, purposive sampling technique was used to select three States, one agricultural zone in each State and three Local Government Areas (LGAs) in each zone giving a total of nine LGAs. In the fourth and fifth stages, four communities and one village in each community were randomly selected from the LGA. This gave a total number of 36 Communities and 36 villages respectively. From the sampling frame comprising 96 farmers in Abia, 216 farmers in Ebonyi and 908 farmers in Enugu, proportionate and random sampling technique was used to select a sample size of 408 farmers comprising; 32 farmers in Abia State, 72 farmers in Ebonyi State and 307 farmers in Enugu State.

Primary Data were collected through the use of interview schedule based on structured questionnaire. Data were collected on the following variables; socioeconomic factors such as age, education and farming experience.

Descriptive statistics such as means, frequencies and percentages were used to analyze technologies utilized and products generated. The relationship between socioeconomic factors and technology change were examined using contingency tables.

Net return analysis was used to obtain the net farm income. It is given thus;

NFI = TR – TC
where NFI = Net Farm Income (₦)
TR = Total Revenue (₦)
TC = Total Cost (₦)

3.0 Results and discussions

3.1 Socioeconomic factors and level of technology utilized

The results show cross tabulation between levels of technology utilized and socioeconomic factors such as age, education, and farming experience.

Table 1: Level of Technology and Age of Farmers

	Age of Farmers			
Level of technology	≤39	40-49	50-59	≥60
≤10	17	32	19	15
11 -12	3.2	40	27	22
22 -32	26	24	31	23
33 – 43	17	5	20	13
≥44	8	1	3	2
Total (n)	76	93	176	61

Source: Survey Data, 2019

The result show that the technologies were majorly utilized by farmers within the productive age range of 50-59years.This comprises farmers with innovative minds and more potential for greater productivity through better efficiency in the use of production technology. The number of farmers beyond 59 years declined probably because farmers beyond this range tend to stick to their age old method rather than being exposed to the perceived risky technology changes. Nwachukwu and Oteh (2014) expressed similar view in their study on factors influencing commercialization by cassava producing household in Abia State.

Table 2: Level of technology and Educational Status

Level of technology	Educational Status			
	informal	primary	secondary	tertiary
≤10	17	19	19	19
11 -12	3	30	53	34
22 -32	29	30	16	34
33 – 43	16	18	12	9
≥44	6	5	0	3
Total (n)	127	149	100	32

Source: Survey Data, 2019

Table 2 shows that over 50% of the farmers with formal education adopted more technologies than those with informal education. This implies that literacy equips the farmers with the potentials to accept new technologies, Gani and Adeoti 2011 also indicated a high positive correlation between level of education and technology adoption by farmers. According to Onubuogu and Onyeneke 2012, education and training enhances farmers productivity and market oriented production objective.

Table 3: Level of Technology and Farming Experience

	Farming Experience				
Level of Technology	≤5	6-10	11-15	16-20	≥21
≤10	38	26	3	74	12
11-21	40	32	61	33	24
22-32	5	29	27	36	18
33-43	13	11	9	11	28
≥44	5	2	0	3	6
Total (n)	40	85	33	157	93

Source: Survey Data, 2019

The result in Table 3 indicate that the bulk of the farmers (36%)with 16-20 years farm experience adopted 22-32 percent technologies This means that years of experience exposes the farmer to new emerging ideas that make them more receptive towards innovations and commercialization. According to Okoye et al 2009, the more experienced a farmer is, the more efficient his decision making processes and the more he will be willing to undertake risks associated with adoption of innovation.

3.2 Types of Technologies and Products generated

The result shows the major technologies and products available. The technologies comprises production and processing technologies.

Table 4: Technologies Utilised by the farmers

Production Technologies	Percentage	Processing Technologies	Percentage
Improved variety	88	Rice Mill	59
Herbicides	55	Gari Machine	81
Inorganic fertilizer	65	Destoning Machine	38
Irrigation Pumps	25	Crop Dryer	18
Yam Miniset	29	Silos	14

Source: Survey Data, 2019

Table 4 shows that the major production technologies are improved varieties and inorganic fertilizer while the major processing technologies are rice mill and gari processing machines. It is clear that there is a more intensive use of production technologies. The implication is that fewer farmers engage in activities that would enhance the marketability of their produce via processing. This is probably because most of the farmers would sell their output directly after production since they lack facilities for further processing. Hence the major products generated are limited to those that can be generated by the available processing technologies.

3.3 Types of Products Generated and Quantity Processed

Table 5 shows that the major products are obtained from crops with higher levels of processing.

Table 5: Products Generated and Quantity processed

Crops	Products	Processed Product	Quantity Processed(%)
Cassava	Gari	145 bags of 50kg	53
	Tapioca	12 bags of 10kg	4
	Cassava Flour	30 bags of 25kg	11
	Cassava Fufu	59 bags of 25kg	22
Rice	Milled Rice	46 bags of 50kg	48
	Destoned Rice	23 bags of 50kg	24
Maize	Maize Shelled	19 bags of 50kg	47
	Maize flour	13 bags of 25kg	32
	Pap	6 bags of 25kg	15
Yam	Yam Fufu	514kg	26
	Roasted yam	202kg	11

Source: Survey Data, 2019

The result indicated that 53% of the Cassava produced per annum is processed into gari. This is probably because most of the farmers have access to gari processing machine. It also shows that 48% of rice is milled while only 24% is de-stoned the farmer. In addition, 47% of Maize harvested is shelled while 15% is processed into pap by the farmers. Most farmers shell their maize probably because it readily serves as raw materials in confectionery, food brewery and livestock feed industries. Other processed forms are majorly consumed at home. Yam is majorly consumed as tuber. However, some farmers processed their yam into fufu (28%) flour and roasted yam which are mainly for subsistence purpose.

3.4. Returns to the Producer through Value Addition.

The returns were computed for the major output processed for sale; gari, milled rice and shelled maize.

Table 6: Returns to Farmers through Value Addition

Crops	output	Quantity Produced(kg)	Quantity Processed(kg)	Produce (₦) Revenue	Product (₦) Revenue
Cassava	Garri	273.8	145	148603.77	286772.39
Rice	Milled rice	95.45	45.62	126561.23	333782.29
Maize	Shelled maize	40.06	19	98501.16	56567.96

Survey data, 2019

The result show that milled rice gave an added value of ₦207,221.06 while gari gave on added value of ₦138,168.62. In maize, although less than 50% of the produce was processed for sale, the revenue generated was more than 50% of the revenue from produce. Yam was not processed for sale. Hence, the revenue generated is solely from the produce. It becomes clear that the returns to the producer are higher in crops with higher value addition by processing.

4.0 Conclusion

The major production technologies utilized by the farmers are improved varieties and inorganic fertilizers while the processing technologies are rice mill and gari processing machines. Therefore the returns to producer through value addition showed that cassava and rice gave the highest return.

5.0 Recommendations

There is need for more sensitization of farmers on the importance of adopting technologies that would enhance value addition by processing. This should be facilitated through government englightment programmes such as skill acquisition trainings which should be well disseminated through extension personnel and farm associations.

In addition, to facilitate availability and cost effectiveness of the processing facilities, more emphasis should be laid on the fabrication and utilization of indigenous processing technologies

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