Assessing the impact of farm diversification on household nutrition: evidence of four sub-Saharan African countries

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Introduction

❖ In SSA, a large proportion of food is produced by smallholder farmers, and they are the main providers of work for the local labor.

❖ Unfortunately, smallholder farmers are facing a lot of challenges including food and nutrition insecurity, and income variability.

❖ Crop diversification can be used as a tool to increase farm incomes, create jobs, reduce poverty, and conserve soil and water resources.

❖ The impact of farm diversification on household dietary diversity and the analysis of factors that affect farm diversification and dietary diversity were analyzed.

Materials and Methods

❑ **Study area**

❖ The survey was conducted in Madagascar, Nigeria, Rwanda and Senegal (Fig. 1).

❖ Main rice producing areas where rice research innovations are integrated into the rice value chain were purposively selected.

Fig. 1: Map of survey countries
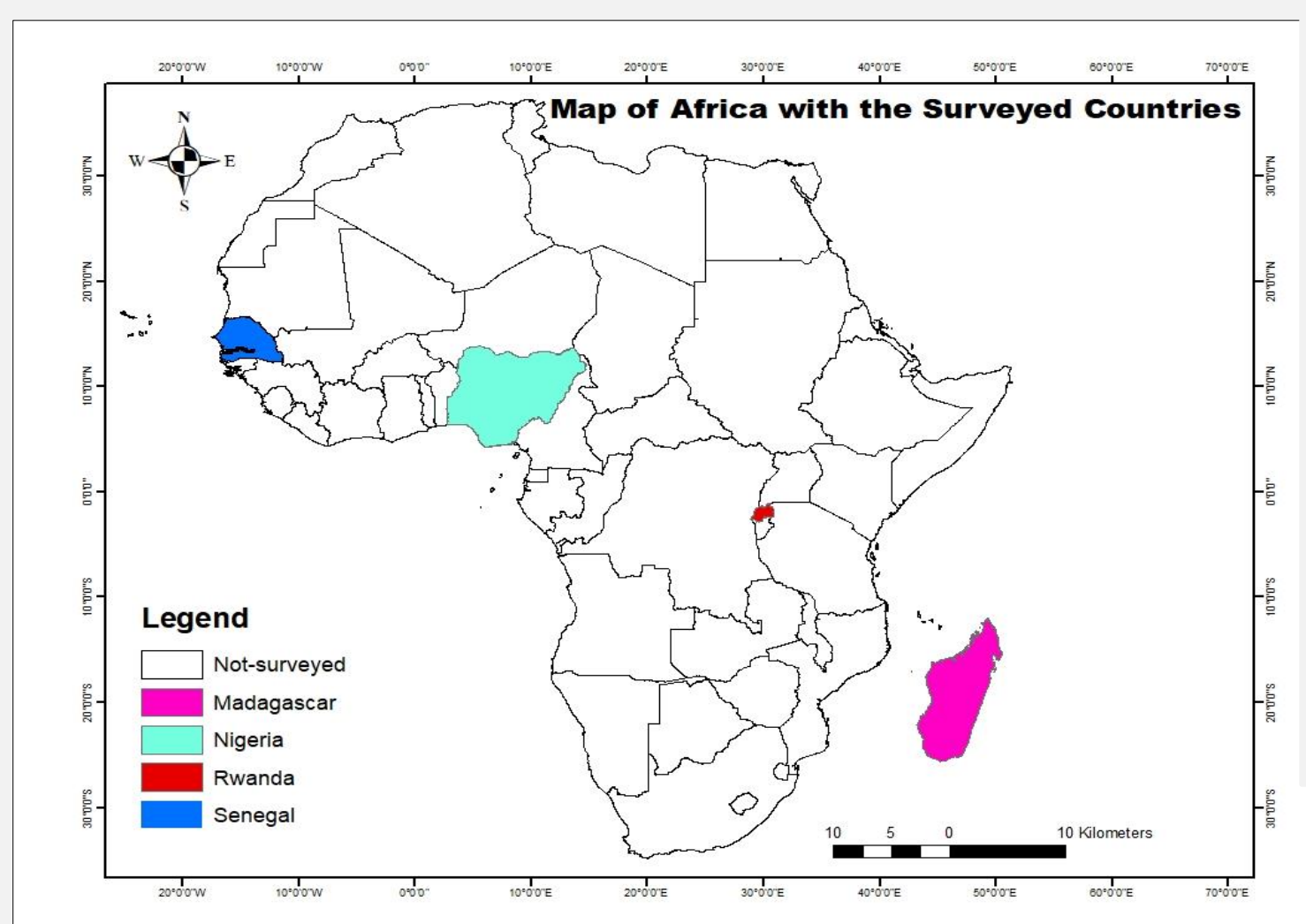
❑ **Data analysis**

❖ The main analysis tool in the study is Instrumental Variables (IV) Poisson regression (IV poisson).

❑ **Variables of interest**

❖ Farm production diversity score (treatment variable).
❖ Household Dietary Diversity Score (HDDS) was the outcome variable.

Results

Fig. 2: Socio-economic characteristics of the households: (A) Education level of household head (years), (B) =1 if received farming training, (C) =1 if received contract credit, (D) =1 if engaged in self-employment in the last 12 months

❖ Cereals and livestock are the main household productions (Fig 3) in the study countries.

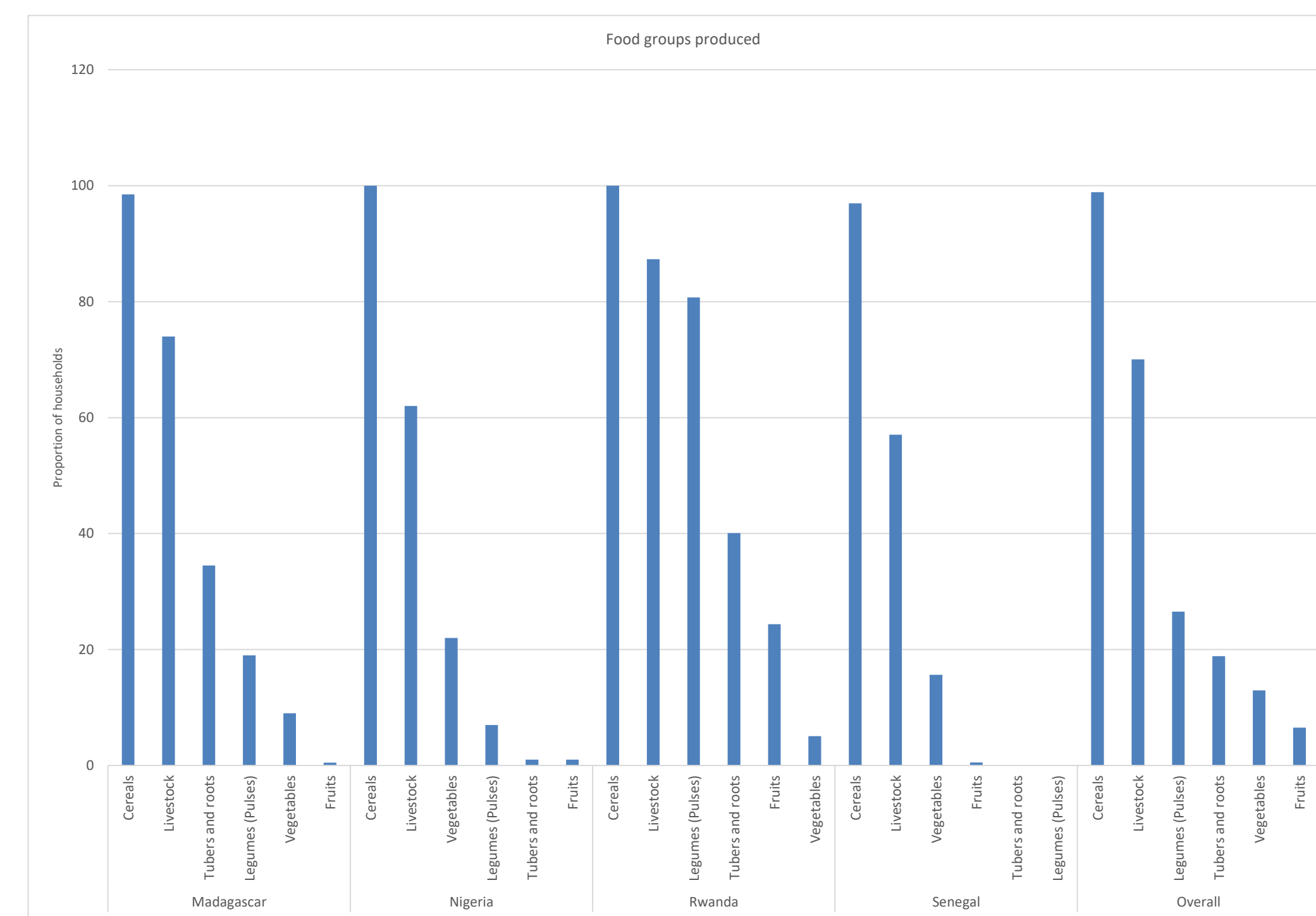❖ Only Nigeria has an HDDS greater than or equal to 6 (Table 1).

Fig. 3: Food groups produced by farm households.

Table 1. Household farm diversity and dietary diversity characters.

Variables	Madagascar (n=200)	Nigeria (n=200)	Rwanda (n=197)	Senegal (n=198)	Overall (n=795)
Farm diversity					
=1 if diversified crop production (%)	80.50	61.50	92.39	15.66	62.52
Farm production diversity score (Crop & livestock count)	3.80 (1.83)	3.62 (1.92)	5.17 (2.03)	2.25 (1.32)	3.71 (2.07)
Dietary diversity					
HDDS	4.03 (1.91)	6.47 (3.25)	4.32 (2.16)	4.98 (2.09)	4.95 (2.59)

( ) Standard deviations

❖ Results showed positive impact of agricultural diversification on household dietary diversity in the four countries (Table 2).

❖ Higher education level is a key driver of dietary diversity in smallholder farming households (Table 2).

Table 2. Linkages between production diversification and on-farm diet (IV poisson regression (Control-function estimator)).

Variables	Madagascar (n=200)	Nigeria (n=200)	Rwanda (n=197)	Senegal (n=198)	Overall (n=795)
HDDS					
Farm production diversity score	**0.050**** **(0.025)**	**0.108**** **(0.043)**	**0.063***** **(0.019)**	**0.086**** **(0.042)**	**0.029**** **(0.013)**
Education of household head (years)	0.026*** (0.007)	0.007 (0.008)	0.011 (0.011)	0.019*** (0.005)	0.030*** (0.003)
=1 if engaged in self-employment in the last 12 months	0.099 (0.069)	0.086 (0.088)	0.316*** (0.074)	0.096* (0.051)	0.210*** (0.035)
=1 if received farming training	-0.258** (0.124)	-0.334** (0.148)	0.576*** (0.123)	0.598*** (0.224)	0.230*** (0.088)
=1 if received contract credit	0.511*** (0.154)	0.028 (0.241)	-0.068 (0.083)	0.426*** (0.099)	0.175** (0.074)
Constance	1.237*** (0.177)	2.537*** (0.335)	1.132*** (0.212)	1.842*** (0.198)	1.195*** (0.121)

( ) Standard error; ** p<0.05, *** p<0.01

Conclusion

➢ Encouraging farming households to produce various crop and animal species can be an effective strategy to improve dietary diversity among smallholder farmer.

➢ However, this relationship is complex; it may be influenced by demographics and socioeconomic characteristics; institutional characteristics, and farm characteristics of households.

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