International Journal of Agricultural Extension and Rural Development Studies
Vol.11, No.2, pp.43-62, 2024
Print ISSN: ISSN 2058-9093,
Online ISSN: ISSN 2058-9107
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development -UK

How much do Public Extension Workers contribute to market-oriented agricultural advisory services? Lessons from Northern Uganda

Richard Miiro[1,5]*, Max Olupot[1, 2], George Jjagwe[1,3], Yunia Nalweyiso[1], John Jagwe[4] and Silim Nahdy[2]
[1]Uganda Forum for Agricultural Advisory Services (UFAAS)
[2]African Forum for Agricultural Advisory Services (AFAAS)
[3]Mountains of the Moon University (MMU)
[4]Alliance for Green Revolution in Africa (AGRA)
[5]Makerere University, Department of Extension and Innovation Studies, School of Agricultural Sciences, College of Agricultural and Environmental Sciences

doi: https://doi.org/10.37745/ijaerds.15/vol11n24362 Published December 30, 2024

Citation: Miiro R., Olupot M., Jjagwe G., Nalweyiso Y., Jagwe J., and Nahdy S. (2025) How much do Public Extension Workers contribute to market-oriented agricultural advisory services? Lessons from Northern Uganda, *International Journal of Agricultural Extension and Rural Development Studies*, Vol.11, No.2, pp.43-62

Abstract: *Market-oriented agricultural advisory services for smallholders are critical to achieving food, income, and economic security in developing nations. Using a market systems view, the study determined the extent to which decentralized public agricultural extension workers delivered specific services for market-oriented agriculture and the enabling and disabling factors. A survey of 184 public agricultural extension officers from Northern Uganda was conducted. Results: The perceived extent to which the extension workers engaged in agricultural risk identification and management, developing farmer organizations, and ensuring farm inputs supply was a mean score of 2.38, 2.31, and 2.28 out of 3 respectively, and between 83.6% and 86.6% of the extension workers engaged routinely with them. The average engagement in agribusiness and markets was 2.00. Most market-oriented activities were engaged in albeit in selected seasons. Enablers included government policies, stakeholder support, and frequent training while limited government support, high extension farmer ratio, and limited leadership on gender and youth inclusion were disablers.*

Keywords: Market-oriented agricultural advisory services, decentralization, enablers, disablers, public extension workers

INTRODUCTION

Market-focused agricultural development among smallholder farmers is on the rise in sub-Saharan Africa (SSA) (Blum, et al., 2020; Tariku et al., 2018). It's driven by the market opportunities of a burgeoning population, urbanisation, healthy feeding, and its role in poverty reduction (Akaniyene and Dimitrios, 2023; Abdulazeez et al., 2022; Muyombano and

Margarita, 2020**).** As a result, market-oriented agricultural advisory services have surged (Ferris et al., 2014; Moore & Hunter, 2018). Given that SSA agriculture is mainly undertaken by smallholder farmers who are mostly transitioning from subsistence farming, their participation in markets demands a lot of capacity building (Situmorang et al., 2023). Additionally, smallholders tend to be heterogenous in terms of their market experience, resources, land size, digital connectivity, extension access, access to financial services, social culture, gender and education status (Blum et al., 2020; Ferris et al., 2014). This heterogeneity, and the challenges in transitioning from subsistence to market-oriented farming present knowledge gaps (Ferris et al., 2014) and the need for relevant extension advice targeting varying farmer categories (Blum et al., 2020).

Smallholder farmers' market participation requires consistent extension and advisory services support in production, marketing and business (Davis et al., 2020; Ferris et al., 2014). For a long-time, extension workers in Sub-Saharan Africa have focused on advising farmers on production issues and less on market related matters (Ferris et al., 2014). SSA governments tend to assume that its public extension workers can support this market led policy direction (IFAD, 2022). Current extension thinking and practice expects extensionists to have technical and functional competencies that support market-oriented farming in the agricultural innovation system (Sulaiman & Davis, 2012). However, little has been done to demonstrate the extent to which publicly employed extension workers are engaging in market-oriented agricultural advisory services (MOAAS) given its holistic and systems outlook (Bitzer et al., 2019).

This is a call for extension performance assessment, but to do it depends on the purpose and variables to assess. Extension worker performance assessment has varied, sometimes focusing on extension programming (Prasetyo & Sinaga, 2020), client responsiveness, developing client capacity, motivating of farmers, human resource management, farmer organizations development, business, attitude and work culture (Abdel-Maksoud & Abdel-Maksoud, 2015; Fasiburo et al., 2008; Linda and Riswani, 2021; Situmorang et al., 2023); farmers' capacity to demand for extension services, equity, farmer-centredness and human capital development (Maake & Antwi 2022). Other aspects have included extension methods (Khan, & Akram, 2012; Talibu et al., 2018), digital capacity (Namyenya et al., 2022) and the entire extension system (Jafari et al., 2022). Very few of the studies have focused on the performance of public extension agents' support to market-oriented agriculture and the extent its being done. Available attempts, do not account for the multiple extension competences and roles represented by the agricultural market system (Ferris et al., 2014; Moore & Hunter, 2018; Sulaiman & Davis, 2012). No study has focused on public extension workers' extent of executing market-oriented advisory services using a market systems perspective. Extension agents are expected to assess farmers' marketing and production needs, provide marketing services, link farmers to service providers, regulate the service, or be consulted by service providers. No study has brought these variations in contributing to market-oriented extension service provision. Finally, there is a need to know what enabling and limiting factors to public extension workers' engagement in MOAAS provision were.

A study was conducted whose objectives were to: i) determine the extent to which public agricultural extension workers perceived their level of engagement in providing services that support market-oriented farming; ii) determine the extension workers' perceived form of engagement for each of the specific areas of services; iii) determine the extension workers' views of factors enabling and limiting their engagement in providing market oriented agricultural extension services.

Such a study is of scientific and policy significance in developing countries in Sub-Saharan Africa, and South Asia given the need to uplift their smallholder farming population from poverty, while contributing to agro-industrialization; including the need to account for public investments in this direction (Jafali et al., 2022; Maake & Antwi, 2023). The study informs the decentralization policies in developing countries that target reaching the last mile. It proffers interest to the African Forum for Agricultural Advisory Services (AFAAS) (https://www.afaas-africa.org/) and to the Uganda Forum for Agricultural Advisory Services (https://ufaas-ugandacf.org/) who are interested in scientifically amplifying this changing extension landscape.

Theoretical anchor and conceptualization

According to Blum et al., 2020, page 53, "Market-oriented farming is farming based on market demand and uses improved production technologies, innovations, commercial inputs and provides consistent quantity and quality of farm produce for sale". While, market-oriented agricultural advisory services encompass aspects of technical knowledge and skill, market savviness, business management skills, organizational development and facilitating of value chain actor processes (Chipeta, et al., 2008).

Market-oriented farming entails enhanced agri-business, and partnership activities for the smallholder farmers including attention to production and marketing standards. Farmers engage in market opportunity identification, contracting, insurance, access to financing, loan management, business development services, post-harvest handling, storage services, business management, marketing, transport, ensuring environmental soundness, following specific production, business and trade regulations among others (Blum, et al., 2020; Ferris et al., 2014). These reveal a dynamic market system, multi-actor, multi-function arrangement with a combination of relationships, functions, and rules guiding service provision, access and exchange (Moore and Hunter, 2018; Jamil et al., 2023). Extension workers are expected to play a role in this multi-faceted system supporting and coordinating actors of the agribusiness ecosystem (Jamil et al. 2023). This entails a market systems approach (USAID, 2017; 2022) in which extension workers (GFRAS, 2017; Sulaiman and Davis, 2012) must demonstrate competence.

Performance assessment of agricultural extension workers

Evaluating agricultural extension providers' performance is critical for improvement, capacity building, accountability, resourcing and addressing the health of the service (Abdel-Maksoud & Abdel-Maksoud, 2015; Blum et al., 2020; Namyenya et al., 2023). Focusing on extension workers' service with a market systems perspective (Blum et al., 2020), a well-delivered

extension service raises the credibility of the workers and the chances of farmers' uptake of that advice (Abdel-Maksoud & Abdel-Maksoud, 2015). Performance evaluations must include the consistency of delivering extension services (Ragasa et al., 2016). Studies are presented here which however have less market focus, but offer a hint on what is assessed and what the results are.

Ragasa et al., (2016) in her study on the factors affecting performance of agricultural extension in the Democratic Republic of Congo, observed that agricultural extension agencies were not interacting with the central officials of the Ministry of Agriculture, financial institutions, other extension agents nor with the input suppliers. Eighty percent of the extension organizations had not interacted with input suppliers, traders, Universities nor research institutes. Fabusoro et al. (2008) in a study about job motivation and performance of field level extension agents in Ogun State in Nigeria, found an average rating of job performance of just fairly average. Bosses rated their field extension workers to be performing at 46%, and this low level was attributed to low worker motivation.

Linda & Riswani (2021) who had farmers evaluating extension workers performance in South Sumatra in Indonesia, had the workers scored highly on aspects of extension program preparation, implementation, evaluation, and report development. Namyenya et al., (2020) who analysed the performance of agricultural extension managers in Uganda in terms of staffing, planning and reporting found them to be low. Only 39% had submitted their annual work plans in time.

Job performance of extension workers in Yemen which focused on quality and quantity of work, dependability, feedback activities, attendance to extension activities, and farmer satisfaction, only 16% performed highly (Khalil et al., 2009). Situmorang et al., 2023 assessed extension workers execution of roles like visiting farmer groups, organizing extension materials, building farmer groups, collaborating in organizing training programs, counselling, and assisting in farmer group administration. A high level of success was realised, with 87% of the extension workers scoring an average of 15.63 out of 18 scores.

Factors that enable delivering market oriented advisory services

Several factors are known to influence extension service delivery albeit not necessarily related to market oriented advisory services. Extension workers' motivation, the organization's climate, receiving continuous training and having experience influenced their performance (Linda & Riswani, 2021; Situmorang et al., 2023). Ragasa et al., 2016 found remoteness, lack of transport and funds, time constraints due to workload and responsibilities constrained partnership interactions of the Congolese extension workers. Extension workers who had received training had chances of performing better their roles. Availability of finance and physical resources enhanced performance. The extension workers' competency in program planning, implementation and evaluation influenced their performance (Khalil et al., 2009).

The analytical framework

Fourteen competence areas an extension worker promoting MOAAS is supposed to have were identified and used to assess the level of engagement of in market-oriented agriculture (Blum et al., 2020; Chipeta et al., 2008; USAID, 2017; 2022; GFRAS, 2017). The areas are presented below:

Agriculture inputs and business development services	**Agricultural production services**	**Agribusiness and market access services**
i) Provision of quality farm inputs - seed, fertilizers, crop protection, tools ii) Provision of financial services iii) Provision of farmers' organizations development services iv) Engaging in agricultural risk identification and management v) Providing agricultural insurance	i) Provision of agricultural information on post-harvest handling ii) Provision of irrigation services iii) Provision of weather and climate information	i) Farm management, agribusiness, value chain participation ii) Production standards and product standards iii) Agro-entrepreneurship training iv) Output/off takers/aggregators services v) Business development services such as transport, logistics, storage, vi) Agricultural insurance services

For each of the above, the level of each extension officer's engagement was assessed at five levels. Whether the extension worker:

i) Conducted needs identification for the service
ii) Directly provided the service advising or training
iii) Engaged in brokerage, coordinating networking, and linking of private service providers or non-agricultural ministries, departments or agencies to specific clients – the farmers,
iv) Conducted technical oversight and regulated the quality of the service offered by another non-government agency or the private sector.
v) Was consulted by the service provider

METHODOLOGY

Study design

The study employed a mixed methods design. A sample survey was conducted of publicly employed agricultural extension officers from Northern Uganda. These included district agricultural officers, veterinary officers and commercial officers who were accessed in a field survey and others during a training that was organized at a training centre in Makerere University College of Agricultural and Environmental Sciences, where they were attending refresher courses. A total of 184 respondents was obtained.

Instrumentation

The data was collected using a questionnaire. Data on the extent of engagement was captured at three levels that is 'activity being done in all seasons', 'selected seasons', and 'never been carried out'. For the analysis, the scores for 'all seasons' and 'selected seasons' were combined to get a percentage labelled '**regularly'.** This implied an activity that is implemented routinely. While open-ended questions were used to capture enabling and disabling factors.

Data collection and analysis

The survey was self-administered and data entered and analysed using SPSS version 27. Data was analysed for its distribution using percentages, and for the measures of central tendency mainly means and standard deviations.

RESULTS

The socio-economic characteristics of the respondents

Out of 184 extension workers, 99.5% indicated that most of the farmers they worked with were engaged in market-oriented agriculture. Seventy-three (73%) of the respondent extension workers were male while 27% were female. Fifty-seven percent (57.6%) had a university degree, 28.8% had a diploma, 9.2% with a master's degree, 2.7% with a postgraduate diploma, and only 3 (1.6%) had a certificate. Thirty-eight percent (38%) had one to five years of working experience, 33.2% had between 6 and 10 years, and 5.4% of less than 1 year of work. Marketable agricultural produce included soya beans, maize, and sunflower mainly grown by men, women and youth, simsim, beans, cabbage, tomatoes, onions and sukuma wiki by women. Cassava and cotton by men. Livestock included piggery, poultry (local and improved breeds) and goats by women. Cattle mainly for the men; bee keeping, fish farming also led by men. Markets were mainly within the districts, and some outside the district especially for men, and in neighbouring countries of South Sudan and Kenya. For Soybean and Sunflower, there were private companies which bought them, most of the other produce was bought by traders. The extension workers indicated that most marketing is done by individual farmers to traders, there

is limited farmer organization involvement in markets despite efforts to build farmers' organizations.

Agricultural Extension workers' engagement with agro-inputs and business development services

Five service areas related to agro-inputs and business development services were assessed, and in addition, the forms in which they were executed i.e., conducting a needs assessment, directly providing the service, linking the service to clients, regulating the service and being consulted. Mean scores and the percentage of extension officers who routinely engaged in that service are presented (Table 1.0).

Level of engagement with the five service areas

Overall, 87% of the extension workers indicated to be engaged in farm inputs services, 85% in farmer organizations development, 84% in agricultural risk identification and management. Sixty-six percent (66%) indicated to be engaged in financial services, and 30% in agricultural insurance. In terms of extent of engagement in a particular aspect, on average, the extension workers scored themselves 2.38 out of 3 scores on the extent to which they engaged with agricultural risk identification and management. The mean engagement score for building farmers' organizations was 2.31, 2.28 for farm inputs, while for financial services, and agricultural insurance it was below 2.0. Given that the extent of engagement was measured in terms of seasons an extension worker executed this activity, the above scores show that the extent of engagement most services was for selected seasons in some years and not each and every season, while for scores below 2.0 it meant, this activity was seldom or rarely engaged in. *Level of engagement within specific forms of service*

The forms of services that were undertaken under each of the five service areas of agri-inputs and business development services were assessed (Table 1.0, row focusing on average score per level). Seventy-six percent (76%) of the extension workers were linking farmers to the 5 services, followed by 74% who conducted needs assessment, then 72% did direct service provision, 65% were consulted, and 64% regulated the five areas of service. The extent of engagement had scores of below 2.40 implying that these are engaged in selected seasons.

For the needs assessment Ninety-one (91%) of the extension workers conducted needs assessment for agricultural risk management, 88% assessed needs for farm inputs and a similar proportion assessed farmer needs related to farmer organizations' development, 69% for financial services, and 33% assessed farmers' agricultural insurance needs. Assessing needs for agricultural risk management got a score of 2.54 implying the service has been conducted close to all seasons. The rest had a score of less that 2.4 implying that these were conducted in selected seasons, while for insurance it was rare.

For the direct provision of services, 91% of the extension workers indicated that they directly provided farm inputs, 89% directly provided agricultural risk identification and management services, and 88% farmer organizations development (Table 1.0). Those in direct financial service provision were 63% and 28% for agricultural insurance. The mean scores were between 2.47 and 1.34 implying direct provision was occurring in selected seasons, but with insurance done on rare occasions.

Linking clients to services, 95% of the extension workers indicated to linking farmers to farm inputs, those for linking farmers to farmer organizations' development services were 90%, to agricultural risk identification and management, 86%, to financial services 78%, and to agricultural insurance only 34%. The extent of linking farmers to farm inputs services had a score of 2.51 implying frequent or doing this in almost all seasons. While all the other scores being between 2.42 and 1.40 indicated that the extent linkage was in less frequent seasons to rarely happening.

Regulating services for quality assurance, 84% of the extension workers were engaged in regulating the quality of farm input services, while 79% were linking for farmer organization development, and 77% of the Extension officers were regulating agricultural risk identification and management services. Regulating financial services and agricultural insurance had 54%, and 27% of the extension workers involved respectively (Table 1.0). All the scores to determine the extent of engagement seasonally for all the 5 services was below 2.30 implying that this regulation was done just for selected seasons, and with insurance (1.34, s.d=0.6) rarely regulated.

Being consulted: Seventy-nine percent (79%) of the extension workers indicated to being consulted on farmer organizations' development, while 76% were consulted on agricultural risk management, 75% on farm inputs, 64% on financial services, and only 32% on agricultural insurance. The level of engagement was between 2.26 and 1.37 implying that being consulted was in certain seasons, while for agricultural insurance on rare occasions.

Agricultural production-related extension services

Focusing on the extent to which public agricultural extension workers implemented agricultural production extension activities (Table 2.0, row focusing on average level per service), an average of 91% of the extension workers engaged in agricultural production services. Eighty-four (84%) of the extension workers were engaged with post-harvest handling, while 73% with weather and climate advisory work. On the extent of engagement, advising on agricultural production had an overall average score of 2.48 meaning that the engagement happened in 'selected seasons' closer to 'all seasons'. The other services had scores between 2.32 and 1.72 meaning that these were involved in in selected seasons.

On the forms of extension service for the four areas of agricultural production services. Eighty-two (82%) percent of the extension workers indicated to be engaged in needs assessment followed by 80% who indicated engaging in direct service provision, 79% in linking farmers to these services, 68% each in regulating the service, and being consulted about agricultural production related services. The extent of engagement scored between 2.27 and 2.04 implying that overall, these forms of services were conducted in selected seasons.

Specifically, within needs assessment, direct provision, linking the service, regulating the service, and being consulted, agricultural production came out as the most engaged in service with the average level of engagement at 2.60 (sd=0.57), 2.60 (s.d.=0.57), 2.41 (s.d.=1.56), 2.38 (s.d.=0.66), and 2.40 (s.d.=0.65) for all forms of service respectively. For needs assessment and for direct provision, the level of engagement was 2.60 meaning this happened almost in all seasons. The next one when all forms of service are considered was post-harvest handling, the

third weather and climate information, and the least irrigation. All of their mean scores were below 2.45 meaning that they were being conducted in selected seasons.

International Journal of Agricultural Extension and Rural Development Studies
Vol.11, No.2, pp.43-62, 2024
Print ISSN: ISSN 2058-9093,
Online ISSN: ISSN 2058-9107
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development -UK

Table 1.0. Percentage and level of extension officers' routine engagement with agri-inputs and business development services (n=184)

Percent (%) of officers involved with the service, level of engagement with the form of service

Area of service	Assessing needs			Direct provision			Linking services			Regulating service			Consulted			*Overall average*	
	%	Mean score	S.d.	%	Mean score	S.d.	%	Mean score	S.d.	%	Mean score	S.d.	%	Mean score	S.d.	%	Mean score
Farm inputs	88	2.32	0.67	91	2.32	0.63	95	2.51	0.56	84	2.13	0.65	75	2.11	0.76	**86.6**	**2.28**
Financial services	69	1.93	0.70	63	1.84	0.70	78	2.13	0.70	54	1.72	0.72	64	1.89	0.75	**65.6**	**1.90**
Farmer organisations	88	2.31	0.63	88	2.47	1.60	90	2.42	0.58	79	2.16	0.67	79	2.18	0.69	**84.8**	**2.31**
Agricultural risk identification	91	2.54	0.64	89	2.47	0.66	86	2.4	0.69	77	2.24	0.77	76	2.26	0.79	**83.8**	**2.38**
Agricultural insurance	33	1.40	0.63	28	1.34	0.60	34	1.40	0.61	27	1.34	0.60	32	1.37	0.59	**30.8**	**1.37**
Average per level	**73.8**	**2.10**		**71.8**	**2.09**		**76.6**	**2.17**		**64.2**	**1.92**		**65.2**	**2.33**		**70.3**	

Table 2.0. Percentage and level of extension officers' routine engagement with services that enhance agricultural production

	Percent (%) of officers involved with the service, level of engagement with the form of service																	
Area of service	**Assessing needs**			**Direct provision**			**Linking services**			**Regulating service**			**Consulted**			***Overall average***		
	%	**Mean score**	**S.d.**	**%**	**Mean score**	**S.d.**	**%**	**Mean score**	**S.d.**	**%**	**Mean score**	**S.d.**	**%**	**Mean score**	**S.d.**	**%**	**Mean score**	
Agricultural production	95	2.60	0.57	95	2.60	0.57	92	2.41	1.56	84	2.38	0.66	88	2.40	0.65	90.8	2.48	
Post-harvest handling	89	2.40	0.65	89	2.43	0.64	86	2.38	0.67	77	2.20	0.75	77	2.20	0.72	83.6	2.32	
Irrigation	65	1.82	0.67	54	1.71	0.70	59	1.83	0.74	45	1.61	0.72	50	1.67	0.74	54.6	1.72	
Weather and climate information	79	2.26	0.74	82	2.27	0.70	80	2.22	0.70	66	1.96	0.77	57	1.99	0.77	72.8	2.14	
Average per level of engagement	82	2.27		80	2.25		79.3	2.21		68	2.04		68	2.07	72.5	2.07		

Agribusiness and market services

Agribusiness and market extension services had 5 areas of focus (Table 3.0). Overall, 76% of the extension workers were involved in advising on farm planning and management, while 75% were advising on production standards, 73% on output markets, 71% on value chain value chain and market and 64% were advising on product standards. The average level of engagement score was between 2.17 and 1.95 (Table 3.0) implying that extension workers provision of these kinds of services happened in selected seasons but tending more to less frequent levels of engagement. On the forms of extension service with all 5 areas of agribusiness and market services, 79% of the extension workers indicated to engaging in direct provision of these services, and assessing related needs, while 77% indicated to be involved in linking farmers to these services, 68% in regulating, while 56% being consulted. Given that the average level of engagement was scored between 2.17 and 1.91, it is clear that these are conducted in selected seasons, and more towards less frequent engagement.

Needs assessment for agribusiness and market services: Eighty four percent (84%) of extension workers indicated to conducting needs assessment for value chain and market participation, 82% were assessing needs for farm planning and management, 79% for production standards, 78% on output markets, and 71% on agricultural product standards. The average level of extension worker engagement in needs assessment was between 2.33 and 2.05 implying that needs assessment were conducted in selected seasons, but since the scores are less than 2.5 it meant that this happened less frequently (Table 3.0).

Direct provision of services: Eighty five percent (85%) of the extension workers indicated that provided direct services to farmers on farm planning and management, while 82% provided value chain and market participation advise, 81% on production standards, 79% on output markets, and 68% on product standards. The mean score for the extent of directly providing these services ranged from 2.22 to 2.00 implying that took place in selected seasons, and may not be routinely conducted.

Linking clients to services: Eighty four percent (84%) of the extension workers indicated to be linking the service of farm planning to the farmers, 79% were linking value chain and market participation, as well as output markets to farmers, 77% linking services on production standards and 67% on agricultural product standards. The mean score for linking services to farmers ranged between 2.22 and 2.01 implying that linking these services to farmers took place in selected seasons, and may not have been conducted in every season.

Regulating services: Seventy three percent (73%) of the extension officers indicated to regulating value chain and market participation services, while 71% regulated production standards, 67% regulated farm planning, 65% output markets, and 62% product standards. The mean score for regulating these services ranged between 2.11 and 1.92 implying that regulating these services took place in selected seasons, and may not be routinely conducted.

On being consulted, 65% of the extension workers indicated to being consulted on services like farm planning and management, production standards, output markets, while 52% were consulted about agricultural product standards, and 35% on value chain participation. The mean score for being consulted ranged between 2.00 and 1.91 implying that being consulted took place in selected seasons, and may not be routinely conducted.

Table 3.0. Percentage and level of extension officers' engagement with agribusiness and market services

	Percent (%) of officers involved with the service, level of engagement with the form of service																
Area of service	**Assessing needs**			**Direct provision**			**Linking services to farmers**			**Regulating the service**			**Consulted**			***Overall average engagement***	
	%	Mean score	S.d.	%	Mean score	S.d.	%	Mean score	S.d.	%	Mean score	S.d.	%	Mean score	S.d.	%	Mean score
Farm planning and management	82	2.19	0.71	85	2.22	0.66	84	2.20	0.66	67	1.93	0.73	65	1.93	0.75	76.6	2.09
Value chain and market participation	84	2.33	0.97	82	2.21	0.62	79	2.22	0.68	73	2.11	0.71	35	2.0	0.70	70.6	2.17
Production standards	79	2.15	0.72	81	2.2	0.71	77	2.14	0.73	71	2.03	0.74	65	1.92	0.73	74.6	2.09
Agricultural product standards	71	2.05	0.74	68	2.00	0.75	67	2.01	0.76	62	1.92	0.77	52	1.78	0.77	64	1.95
Information on output buyers/markets	78	2.14	0.72	79	2.13	0.67	79	2.18	0.70	65	1.94	0.75	65	1.93	0.74	73.2	2.06
Average per level of engagement	78.8	2.17		79	2.15		77.2	2.15		67.6	1.99		56.4	1.91		**71.8**	

Factors that enabled the public extension workers to implement market-oriented agricultural advisory services (MOAAS)

One hundred and thirty-five (135) men and 49 women agricultural extension workers shared the factors that enabled them to provide advisory and extension services. The most commonly mentioned enabling factors included:

- Presence of, and good coordination with stakeholders like seed traders, banks, farmer organizations that bulk, Village Saving and Lending Association (VSLAs), Uganda National Meteorological Authority, Zonal Agricultural Research and Development Institute, traders, and cooperatives (56 men, 22 women)
- Capacity-building opportunities from NGOs, and the government (32 men, 16 women)
- Technology advancement e.g., mobile phone penetration, applications, internet, social media (13 men, 10 women)
- Government schemes like Operation Wealth Creation an agricultural input provision program to small holder farmers (10 men, 6 women)
- Support with resources to do the work such as the grant from the government to support extension workers, availability of motorcycles (7 men, 7 women)
- Qualified staff (Knowledgeable and experienced) (7 men, 4 women)
- Farmer willingness (6 men, 5 women)
- Knowledge about inputs and research (8 men, 2 women)
- Passionate about the job (6 men, 2 women)
- Farmer groups to peer support each other (3 men, 1 women)

The factors that limited the extension workers in executing MOAAS

Several factors were reported to disable extension workers from the provision of MOAAS services. These included:

- Limited government support, funding and bureaucracy (24 men, 22 women)
- Limited capacity building for extension workers, and knowledge in some fields (18 men, 13 women)
- Poor marketing system and capacity to control middlemen – traders (15 men, 12 women)
- Lack of equipment e.g., motorcycles, cameras, and computers (13 men, 7 women)
- High extension to farmer ratio (12 men, 7 women)
- Lack of policies and laws on standards and enforcement (15 men, 3 women)
- The limited number of agro-inputs dealers and lack of information on agricultural inputs (8 men, 4 women)
- Lack of trust among farmers and poor attitude towards government programs (8 men, 3 women)
- High cost of fuel (4 men, 6 women)
- Poor technology access compounded by poor internet network (3 men, 4 woman)
- Poor linkage with service providers and private partners (3 man, 3 women)
- Lack of interest among farmers for new knowledge (3 men, 2 women)
- Lack of specialization in particular crops (3 men, 0 women)
- Limited farmer knowledge about the value of quality produce (3 men, 0 women)

- Land fragmentation (3 men, 0 women)
- Lack of organized farmer groups (1 men, 1 women)
- Counterfeit products on the market (1 men, 1 women)
- Inaccessible lucrative markets (1 men, 0 women)
- Poor planning (1 men, 0 women)

Discussion of results

The study was conducted to determine the extent to which decentralized public agricultural extension workers in Northern Uganda perceived themselves to be engaged in market-oriented agricultural advisory services (MOAAS). Secondly, it was to determine the extent to which extension workers perceived themselves to be engaged within specific forms of service provision for each of the areas of service. Thirdly, to determine the extension workers' views of factors that affected their engagement with MOAAS. Three broad areas of service were looked at including agro-inputs and business development, agricultural production, agribusiness and markets. Under each of these, forms of engagement were assessed including conducting needs assessments, directly providing the service, linking services to farmers, regulating the service, and being consulted about the service.

Extent of delivering agro-inputs and business development advisory services

The assessment of public extensions' involvement with market-oriented agricultural advisory services (MOAAS) with a market systems view has revealed that on the whole they are involved. The percentages of those involved are high except in aspects of agricultural insurance, and irrigation.

The extent of engaging with these services was moderate or offering of these services in selected seasons, except of those services that seem to be happening in rare occasions such as insurance, financial services, irrigation and agricultural product standards. Some of these might require greater competence among the extension workers, and also business maturity and experience among the farmers.

The extension workers are also engaged in all the five forms of service delivery that were focused on in this study. Most workers are engaged in linking services to farmers, particularly for farm inputs and farmer organizations development, then assessing farmer needs especially for agricultural risk management, farm inputs, and farmer organizations development, and direct provision for mainly farm inputs, agricultural risk identification, and management, and farmer organizations development. All these efforts speak to a shift among farmers towards market-oriented farming, which was informed by the fact that all extension workers interviewed were supporting farmers who were producing for the market.

Extent of delivering under the agricultural production related extension area

The percentages of public extension workers who engaged in advisory services related to agricultural production was between 55% and 91%. Highly engaged in services being agricultural production or agronomic advice, post-harvest handling and weather and climate information. The extent of providing these services was all seasons for agricultural production

or agronomy advice and selected seasons for post-harvest handling. These are important areas of advice as they ensure an adequate supply of farm produce for the market.
Out of the five forms of service, under agricultural production, extension workers were frequently but done in selected seasons engaged in assessing farmer needs mainly in the areas of agronomy advice, post-harvest handling, and weather information. The same trend was true for direct provision of these services, linking, regulating, and being consulted.

Extent of delivering extension services under agribusiness and markets
The proportion of public extension workers that were involved in agri-business and market related advisory services including was between 64% and 77%. Most workers were involved in farm planning and management, production standards, output markets, and value chain and market participation.

The extent of engagement, as measured in seasons by the public extension workers was highest with value chain and market participation, farm planning, and production standards. However, these seem to be conducted in selected seasons. This speaks to a slightly less routinized engagement in this important set of market-oriented agricultural advisory services. It might be due to lack of expertise and may be lightly addressing them. It also speaks to the likely low-level development of farming as a business culture among the farmers.

The forms of delivering the services were also happening in selected seasons and mainly at the level of needs assessment focusing on value chain participation, and farm planning, direct provision that is for farm planning, and linking services to farmers for value chain participation. The extent of engagement under this is less frequent, and with nothing happening every season. Generally, the extension workers rated them selves to be engaged with various aspects of the MOAAS often some times, but there were also those for which they had the highest rating of engaging with some of the activities in all seasons. The later kind of services related with needs assessment and direct provision of agricultural risk identification and management, agricultural production, as well as provision of linking services to agricultural inputs. There were also services for which there was almost no regular provision of the service.

This paper has shown that extension workers in Northern Uganda see themselves as offering market oriented agricultural advisory services specifically on agri-inputs and business development services in selected seasons, same to agricultural production, and to agribusiness and market services. On the whole it seems they are into routine delivery of MOAAS across all key service areas. What is not clear is the level of reach, as they may be working with a limited number of farmers. The enterprises that the advice is being offered were also not captured. The routine level of engagement is also reflected in the proportions of the extension workers who indicated to be engaging with the specific aspects. The percentages were often above 55% except for the engagement with agricultural insurance. These results were self-rated by the extension workers. Similar studies that have assessed extension worker performance some self-rated (Fabusoro et al., 2008; Ragasa et al., 2016; Situmurang et al., 2023) and other by other parties such as bosses (Fabusoro et al., 2008), or farmers (Jamil et al., 2023; Linda & Riswani 2021) or based on actual deliverables (Namyenya et al., 2020). The results in our

study are similar in some ways with those in Situmurang et al., 2023 who considered some limited aspects of MOAAS , such as developing farmers' organizations. The team found out that scores of 15.6 were obtained out of 18 by extension workers when their work was assessed. While there have been cases where extension workers were rated highly such as in South Sumatra in Indonesia, the focus was not on market-oriented agricultural advisory services.
The assessment has also looked at percentages of the public extension workers that are engaged in specific MOAAS services and also looked at the number of seasons they were conducting such activities. This was also done for each of the forms of service.

Factors that affect extension workers engagement with MOAAS
The study also sought to determine public extension workers views of the factors that enabled and limited their engagement with MOAAS. The key enablers that were commonly expressed included stakeholder support from NGOs, banks, Village Saving Lending Associations, presence of government programs and supporting policies; presence of ICTs which enable quick reach and interaction among actors, continuous training and capacity building efforts, presence of farmer organizations, and participatory planning focused around gender responsiveness.

The key disablers included lack of government support in terms of sufficient funds, funding from government is inadequate, high extension-to-farmer ratio making it hard to reach more farmers. IFAD 2022 shows that governments are staff-constrained to be able substantial numbers of farmers and for sound business volumes. The cost of fuel to move around was high and prohibitive, poor marketing systems, limited gender leadership, limited youth inclusion, and cultural factors. These were collected qualitatively. Other studies have established factors that enable public extension workers to do their work, Namyenya et al., 2022 pointed to the presence of the government grants to extension managers as an enhancer of their performance. Presence of funds can be a were a motivator to staff members as well as facilities (Lindi & Riswani, 2021). Namyenya et al., (2022) mention training and capacity building as a catalyst. Most literature has yet to delve into the performance of public extension workers in delivering market-oriented agricultural advisory services.

Limitations of the study and future areas of study
While the study was able to create an original outlook on the extent to which decentralized public extension workers are engaged in market-oriented agricultural advisory services. It has also considered the form of service delivery for each area of service, that is whether the extension workers engaged either or in needs assessment, direct provision of services, linking the services to the clients, regulating the service or being consulted. While the design was well thought through, some limitations still prevail. Some of the limitations observed in this study relate with the fact that the data was based on self-rating of the extension workers. Self-reporting tends to result in the overrating of one's performance. There is a need to have the beneficiary farmers evaluate the extension workers based using the same market systems analytical framework. When the beneficiaries are evaluated, they will need to be segmented to capture segmented client satisfaction. This will also aid the extension workers to strategize

better on how to reach the different segments of market-oriented farmers. This study needs to be extended to private sector market-oriented agricultural advisory service provision.
The study also looked at role execution by the extension workers but did not cater for the use of extension services by the farmers, and the level of farmer satisfaction with the extension services rendered. The study also missed to focus on specific agricultural value chains, such as the government priority agricultural enterprises. The study also needs to move beyond the qualitative measurement of performance to a quantitative one. A look at the recorded evidence can also augment the measurement of extension worker such as what Namyenya et al., 2022 considered.

The extent of engagement in the market-oriented advisory services was measured using a qualitative and subjective measure of seasons. There is a need for example of obtaining the definite number of times these services have been conducted in a year. The number of farmers served also needs to be captured and the volumes of business dealt with for specific agricultural value chains.

Future studies need to consider the strategies that the public extension workers are using to engage the market oriented small holder farmers. This can be done for each of the areas of MOAAS, and for each form of service delivery whether needs assessment, direct provision, linking services to clients, regulating the service, and or being consulted. While the study looked at the forms of service, it missed out the qualitative description of how those services were conducted, and with who. The qualitative measurement using in-depth interviews will be helpful to triangulate what was obtained in this study.

The results captured a sample of respondents that were from the entire Northern region of Uganda. It needs to be able to get the status for specific districts to see variation and understand the factors that cause variation in performance under a decentralized system (Mushemeza, 2019).

Policy implications

Given the move towards market-oriented agriculture and therefore market oriented agricultural advisory services, this study has helped in understanding the contribution of public extension workers to this area (Blum et al., 2020). Given key Uganda government policies including the one on decentralization, agro-industrialization and the parish development model, it is clear that government public extension workers have risen to the occasion as evidenced by their high levels of engagement, however more work is needed. While there were areas that stood out as being routinely engaged in, there were those that are critical in this era of market-oriented farming and deepened communication networks that liked behind. For example, the use of ICTs both old and new. The other one was the area of irrigation, as market-oriented agriculture need not be weather dependant given that climate change is here to stay. The enabling factors have pointed to what governments can do to enhance staff's commitment to market oriented advisory services, and also deal with the limitations to extension worker success. The results need to be shared widely to stimulate debate, and strategic action at decentralized governments.

REFERENCES

Abdel-Maksoud, A., & Abdel-Maksoud, B. (2015). Developing a performance measurement model for agricultural extension agents: An interdisciplinary approach. *Journal of Accounting & Organizational Change*, *11*(2), 215-246.

Away, S. F. Y., Fitriana, L., & Nasution, H. H. B. (2022). Analysis of Farmers' Satisfaction Level with the Performance of Agricultural Extension Agents (Case Study of Rantau Kasai Village, North Tambusai Subdistrict, Rokan Hulu Regency, Riau Province). *Open Global Scientific Journal*, *1*(2), 57-76.

Bitzer, V., Rappoldt, A., Van Veldhuizen, L., & Mur, R. (2019). Towards demand-driven services? The role of feedback mechanisms in agribusiness-based advisory services for smallholder farmers. *Enterprise Development & Microfinance*, (3), 206-220.

Blum, M.L., Cofini, F., Sulaiman, R.V. 2020. Agricultural extension in transition worldwide: Policies and strategies for reform. Rome, FAO. https://doi.org/10.4060/ca8199en

Davis, K., S. C. Babu, and C. Ragasa. 2020. Agricultural Extension: Global Status and Performance in Selected Countries. Washington, DC: International Food Policy Research Institute. https://doi .org/10.2499/9780896293755.

Fabusoro E., J.A. Awotunde, C.I. Sodiya & C.I. Alarima (2008) Status of Job Motivation and Job Performance of Field Level Extension Agents in Ogun State: Implications for Agricultural Development, Journal of Agricultural Education and Extension, 14:2, 139-152, DOI:10.1080/13892240802019113

GoU (2017). Revised job descriptions and person specifications for the production department in local governments 2017. https://www.publicservice.go.ug/media/resources/JDs%20for%20LGs%202017%20Production.pdf

Jafari, N., Karami, E., Keshavarz, M., & Karami, S. (2022). The performance and inhibitors of the new agricultural extension system: Towards empowering small-scale farmers in Iran. Iran Agricultural Research, (Articles in Press).

Khalil, A.H.O., Ismail, M., Suandi, T. & A. D. Silong (2009). Human resource development competencies as predictors of agricultural extension agents' performance in Yemen, Human Resource Development International, 12:4, 429-447, DOI: 10.1080/13678860903135854

Khan, A., & Akram, M. (2012). Farmers' perception of extension methods used by Extension Personnel for dissemination of new agricultural technologies in Khyber Pakhtunkhwa, Pakistan. *Sarhad J. Agric*, *28*(3), 511-520.

IFAD, 2022. Lessons learned from supporting pluralistic extension services in Asia and Africa. https://www.ifad.org/documents/38714170/46847063/lessons-extension-services.pdf/e7b2bbe5-c1d7-1438-21c7-1fb903efeafb?t=1669635950998

Linda, W. (2021). The Influence Of Extension Worker Characteristics, Motivation And Organizational Climate On Performance Of Agricultural Extension Worker On Implementation Of Serasi Program In Tanjung Lago Subdistrict Regency Of Banyuasin South Sumatra, Indonesia.

Maake, M. M. S., & Antwi, M. A. (2022). Farmer's perceptions of effectiveness of public agricultural extension services in South Africa: an exploratory analysis of associated factors. *Agriculture & Food Security*, *11*(1), 34.

Mushemeza, E., D. (2019). Decentralisation in Uganda: Trends, Achievements, Challenges and Proposals for Consolidation, Kampala: ACODE Policy Research Paper Series No.93

Prasetyo, A. S., & Sebastian Sinaga, A. (2020). Performance of agricultural extension workers in implementing urban agriculture programs in Banyumanik District, Semarang City, Indonesia. *Journal of Socio Economics and Development*, *3*(1), 29-36**.**

Sawitri, B., Amanah, S., Saleh, A., Vitayala, A., & Hubeis, S. (2020). Development Strategies of Extension Service Performance using Importance Performance Analysis and Customer Satisfaction IndexMethods in Bondowoso, East Java, Indonesia. International Journal of Advanced Science and Technology, 29(4), 5663-5677.

Situmorang, W. T., Supriana, T., & Pane, T. C. (2023, September). Factors correlating to the success rate of agricultural extension in improving sustainability (a case study at BPP Tanjung Beringin, Tanjung Beringin Subdistrict, Serdang Bedagai Regency). In IOP Conference Series: Earth and Environmental Science (Vol. 1230, No. 1, p. 012017). IOP Publishing.

Sulaiman, V. & Davis, K. E. 2012. The "New Extensionist": Roles, Strategies, and Capacities to Strengthen Extension and Advisory Services. Global Forum for Rural Advisory Services, Lindau, Switzerland.

Talib, U., Ashraf, I., Agunga, R., & Chaudhary, K. M. (2018). Public and private agricultural extension services as sources of information for capacity building of smallholder farmers in Pakistan. JAPS: Journal of Animal & Plant Sciences, 28(6).

USAID (2017). Uganda Agricultural Market Systems Workshop. Workshop Summary Report. United States Agency for International Development – USAID. Prepared independently by the USAID Market System Monitoring Activity and the USAID Monitoring, Evaluation, and Learning Program.

USAID (2022). Feed the Future Uganda Market System Monitoring: Final Report. Prepared by Massachusetts Institute of Technology (MIT) and The George Washington University (GWU)

Vijayaragavan, K., & Singh, Y. P. (1997). Managing human resources within extension.in Swanson, B. E., Bentz, R. P., & Sofranko, A. J. (Eds)Improving agricultural extension. A reference manual.