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Understanding pluralistic agriculture extension services through a social governance lens in Northern Uganda

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This study analyzed the relationship between smallholder farmers' perceptions of pluralistic agricultural extension service and social governance. This was aimed at the identification of significant factors that improve social governance practices of local government planning and budgeting process in northern Uganda. Structured interviews with leaders of smallholder farmer associations were conducted. A multinomial logistic regression was performed to test the association of pluralistic agriculture extension services with social governance practices. The results showed that input supply, the management style of extension agents, as well as monitoring and evaluation of smallholder farmers' activities had a significant and positive influence on the perception of social governance practices. Any negative farmers' perception of these factors weakens the power relations and the legitimacy of the local government planning and budgeting process. The predictor factors could adequately explain less than 50% change in social governance practices. Nonetheless, we developed a model that clearly depicts the need for local governments to adequately focus their plans and resource allocation.

Key words: Agricultural extension systems, governance, legitimacy, multi-stakeholder platform, national agricultural advisory services, planning, power relations, smallholder farmer.

INTRODUCTION

In the colonial days, agriculture extension was considered an economic necessity through which the administration in developing countries acquired agricultural produce as

raw materials for their industries (Barungi et al., 2015). There has been a chronological evolution of extension systems in many countries (Barungi et al., 2015; Semana,

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1999). The pluralistic agriculture extension services concept has stimulated the involvement of many actors in agriculture all aimed at streamlining socioeconomic gains. In the pluralistic agriculture extension services paradigm, the local government agents act as regulators, players, or partners by exercising influence and control through their regulatory and services functions, while the conventional power holders in the community retain their influence on key decisions regarding the selection of whom to participate in a planning meeting and benefit from the pluralistic agriculture extension services (Reed, 1997). Various agricultural extension approaches such as regulatory, advisory, and educational methods have been used to disseminate technologies and other development programs to the communities (Hakiza et al., 2004; Buyinza et al., 2015). This is thought to produce evidence of the promotion of the learning approach, sharing of budget and planning, conducting regular reviews, and improving accessibility, timeliness, and adequacy of information to farmers (Nahdy, 2002). The ultimate effect of these would stimulate trust-building and increase accountability, honesty, integrity, fairness, and responsiveness (Nahdy, 2002). These create interest in pluralistic concepts of agriculture extension and attract a variety of service providers, thus, giving the need for reform agenda with modalities relying on private-sector providers, which are usually perceived as path to improvement (Feder et al., 2011). Some of the private sectors include Advisory Services and Farmer Field Schools composed of many farmer groups/farmer fora (Page et al., 2015). The approach is thought to potentially negate the under-resourced government agricultural extension services (Kindness and Gordon, 2001).

The agriculture extension is now seen to consist of a range of services providing knowledge and information to rural people to enable them to modify their behavior and use technologies to improve their livelihoods (Rivera and Alex, 2004). The services are recognized as a function of both public and private agencies, and institutions. Institutional pluralism in extension systems is premised to create new roles and responsibilities for public sector agricultural extension service provision (Rivera and Alex, 2004). The agriculture extension demand-driven responses have given rise to calls for changes in the traditional public extension systems, which are characterized as outdated, top-down, paternalistic, inflexible, subject to bureaucratic inefficiencies, and therefore less able to cope with the dynamic demands of modern-day agriculture (Rivera et al., 2006). Uganda has implemented the National Agricultural Advisory Service (NAADS) and Farmer Field Schools (FFS) over years. These were thought to promote the formation and strengthening of multi-stakeholder platforms to provide support to farmer-based organizations (FBOs). In addition, establish links with the local government, through information sharing and communication, participatory preparation of projects and programs,

dialogue with the public and private services providers, and promotion, approval, and evaluation of local extension services that inform and influence agricultural policy and planning processes (Badibanga et al., 2013). The trust and interaction developed in FBOs improve information quality and facilitate information sharing and usage processes (Hilary et al., 2017). Therefore, the building of information-sharing networks and relationships between FBOs and other partners or sharing knowledge in a multi-stakeholder platform increases the authority and improves the legitimacy of the local planning process. Although, Cheyns and Riisgaard (2014), and Schouten and Glasbergen (2012) argue multi-stakeholder platform reduces power asymmetry between actors and increases compliance to and acceptance of the policy, there is an under-representation of some groups and an imbalance of power between stakeholders and private actors that take over political functions. This may erode public power because they cannot be held accountable to those who are affected, or lack sanctioning power because of doubts about the effectiveness of voluntary private standards. A model that encourages one-way communication, which reduces effective deliberation needs, unbalanced power relations and reduced legitimacy, has been reported (NAADS, 2001). Such is characterized by (1) unequal opportunity to speak, (2) less obligation to listen attentively and consider carefully the contributions of others, and (3) unrespectful treatment of each other (Nabatchi, 2012). These models prevent opportunities for feedback, and negotiation, and provide little opportunity for discussions about positive outcomes of the planning and budgeting process. Therefore, the extent to which smallholder farmers can achieve the different extension model's assertions in the pluralistic agriculture extension services is not clear yet.

Given the ongoing challenges in securing effective advisory and extension systems, there appears to be a gap in understanding the role pluralistic agriculture extension approaches play in promoting social governance practices in local government planning and budgeting process (Knuth and Knierim, 2016). The involvement of many organizations in the provision of extension services needs governance system convergence. (Mikwamba et al. 2016; Singh and Burman, 2019). Studies may have identified institutional and social governance issues, but not necessarily how the different aspects of pluralistic agriculture extension services affect power relations and legitimacy in the local planning and budgeting process. The changing aspects of pluralistic agriculture extension services outcomes are important in understanding the contribution of the sources and effects of power relations and legitimacy. For this reason, we test the hypothesis that the quality of pluralistic agricultural extension services does not affect the social governance of local government planning and budgeting process. Therefore, social governance practices of local government planning and budgeting process does not

inform the design of a multi-stakeholder governance system in pluralistic agriculture extension service models. To confirm this, we used six (6) independent variables namely; adequacy of facilities to extension agents, input supply, training and technology transfer, management style of extension agents, the capacity and ability of extension agents to perform, and monitoring and evaluation of extension activities selected from among a total of 35 measures of Pluralistic Agriculture Extension Service Provision (PAESP). Many researchers have reported that, to improve the effectiveness and efficiency of resources allocation during planning and enable smallholder farmers appreciate extension service provision: a) the facilities extension agents use need to be adequate to allow them perform well in their work; b) there should be adequate quantity and right quality of the different physical agricultural inputs provided to smallholder farmers, as this enables smallholder farmers to meet their expectations and needs, and realize their goals; c) the types, methods and times of trainings and technology transfer services offered to smallholder farmers have to be appropriate, timely and affordable, for the farmers to meet their technology improvement needs and requirements for effective farmer learning; d) the behavior towards farmers, organization and coordination of smallholder farmer activities by extension agents promotes good relationship between extension agents and farmers for improved technology adoption, to realize the expected outcomes from the farms, and meet the daily requirements of the farmers; e) the extension officers in the local government should have the right ability, capability and knowledge to identify the needs and requirements of farmers to help them improve on farming activity performances and provide better extension services to farmers; and f) the follow-up of farmers' activities and providing feedback to farmers and other stakeholders by extension agents for decision making on future extension services must be informed by the report of extension activity follow-up report in the local government (Andohol et al., 2020; Buadi et al., 2013; Holland and Ruedin, 2012; Sarker and Itohara, 2009; Taylor and Bhasme, 2018). Understanding the relationship between the different aspects of pluralistic agriculture extension services and social governance practices is important in improving smallholder participation in agricultural planning at the local government level. For this reason, we developed a model predicting the relationship between predictor (PAESP) variables on the outcome (social governance). This study is contextualized in line with the synergy view (Woolcock and Narayan, 2000) that address the 'three central tasks: 1) to identify the nature and extent of a community's social relationships and formal institutions, and the interaction between them; 2) to develop institutional strategies based on these social relations, particularly the extent of bonding and bridging social capital; and 3) to determine how the positive manifestations of social capital - cooperation, trust, and institutional efficiency can

offset sectarianism, isolationism, and corruption. We focused on identifying the nature and extent of a community's social relationships and formal institutions, and the interaction between them, and this resulted in the development of a model that clearly depicts the need for local governments to adequately focus their plans and resource allocation in favor of agricultural development strategies.

MATERIALS AND METHODS

Study area

The study was conducted in four districts (local governments) of Amuria, Katakwi, Kitgum, and Lira of the fifty-five (55) Peace Recovery and Development Plan (PRDP) local governments in the northern region of the country (Government of Uganda, 2014) using a database with 308 valid samples of the household survey. The four PRDP local governments derive their investment priorities through bottom-up consultative planning, harmonized participatory planning guidelines, and the regular annual planning processes and have the following population and number of households: Amuria district (270,928: 48,402), Katakwi district (166,231: 30,721), Kitgum district (204,048: 39,959), and Lira district (408,043: 89,165) with the growth rates of 3.4, 2.8, 1.7, and 2.8, respectively. The districts share the same institutional environment but have different ethnic groups with diverse cultural practices comprising the Ateso, Langi, and Acholi tribes of Ateker and Luo ethnic groups. A list of sub-counties (lower local governments), parishes, villages, and smallholder farmer groups were obtained from the Community Development Officer in each of the selected lower local governments, and the respondents were selected through simple random sampling. Only smallholder farmer group members who have attended lower local government planning and budgeting meetings, received support from NAADS, and practiced agriculture for 5 years preceding the data collection were included in the analysis; hence, members of smallholder farmer groups who have not attended lower local government planning meetings and not received support from NAADS were excluded due to their inadequate knowledge on pluralistic agricultural extension service provision.

Data collection and tools

The quantitative data were categorical and collected using a structured questionnaire that was administered in the local languages of Luo and Ateso by trained and experienced research assistants. The questions that assessed the perception of pluralistic agricultural extension provision (PAESP) had 5 responses, namely strongly agree, agree, not sure, disagree, and strongly disagree, which were coded as 1, 2, 3, 4, and 5 respectively. Each of the questions that measured perception and understanding of SG by the smallholder farmers had a similar number of responses that were coded as those of PAESP. The respondents were visited at home by the research assistants. The questionnaire themes were focused on the reduction of power imbalances, compliance to and acceptance of local government planning and budgeting process. Questionnaires were pre-tested with ten members of smallholder farmer groups in each lower local government who were not part of the study respondents and later revised to include local terms as understood by the community. Before data collection the aim and content of the research, roles of the respondents and the benefit that would accrue from the research process were adequately explained to the selected smallholder farmer group members, and they were also given the right to opt-out of the data collection. All

participants were assured of data independence and confidential responses.

Empirical model

This study investigated the relationship between pluralistic agriculture extension service provision (PAESP) and social governance (SG) practices during the local government planning and budgeting processes using Principal Component Analysis (PCA) and Multinomial Logistic Regression (MLR). Given that there were many ordinal variables and sub-variables; PCA was performed on each of the data subsets. The PCA achieved the reduced dimensionality of the original data set consisting of a large number of interrelated variables while retaining as much as possible the variation present in the data set (Milewska et al., 2014). The number of components for each study variable was obtained by the Kaiser–Guttman rule that states the number of factors to be extracted should equal the number of factors having an eigenvalue greater than one. The rationale for choosing this particular value is that a factor must have variance at least as large as that of a single standardized original variable. (Comrey and Lee, 2013) The reduction process for SG measures resulted in 5 being selected from a total of 39 and for PAESP measures resulted in 6 being selected from a total of 35. The Multinomial Logistic Regression was used to test the relationship between PAESP and SG practices. The dependent variable was Social Governance (SG) practices: information provided for planning, knowledge and skills in planning of local agents, local government capacity to plan, attitude and behavior of local agents during planning, compliance and acceptance of local government planning and budgeting process; and the independent variable was pluralistic agriculture extension service provision (PAESP): adequacy of facilities to extension agents, input supply, training and technology transfer, the management style of extension agents, the capacity and ability of extension agents to perform, and monitoring and evaluation of extension activities. In this analysis, the independent and dependent variables were measured as ordinal variables for strongly agreeing, agreeing, not sure, strongly disagreeing and disagreeing for the smallholder perceptions of the quality of pluralistic agriculture extension service provision and social governance practices.

Data analysis

All the data on the perception of the quality of pluralistic agriculture extension service provision and social governance were obtained from the survey questionnaire. In total 39 items measured social governance practices of local government planning and budgeting process and 35 items measured smallholder farmer perceptions of the quality of pluralistic agriculture extension service. Principal component analyses (PCA) were performed on each of the data subsets. The number of components for each study variable was obtained by the Kaiser–Guttman rule that states the number of factors to be extracted should equal the number of factors having an eigenvalue greater than one. The variables used in the analysis had Eigenvalues greater than one, after their reduction using Principal Component Analysis (PCA). The PCA factors were confirmed not to be correlated. The PCA achieved the reduced dimensionality of the original data set consisting of a large number of interrelated variables, while retaining as much as possible the variation present in the data set (Milewska et al., 2014). The rationale for choosing this particular value is that a factor must have variance at least as large as that of a single standardized original variable. The reduction process for SG measures resulted in 5 being selected from a total of 39 and for PAESP measures resulted into 6 being selected from a total of 35. To understand the effects of

the pluralistic agriculture extension system on Social Governance Practices during the Local Government Planning and Budget processes, Multinomial Logistic Regression (MLR) analysis was performed on the dependent (SG) and independent (PAESP) variables to develop model that tested the hypothesis of the study.

RESULTS

Except for the perception of input supply to smallholder farmers that showed the majority of farmers strongly disagreeing that agricultural input supply was adequate, available and reliable, the majority farmers agreed on issues to do with the adequacy and usefulness of facilities for extension agents, training, and technology transfer, management styles of extension agents, and participatory monitoring and evaluation of extension services to influence their participation in local government planning and budgeting process (Table 1). The majority of the smallholder farmers were in agreement that: (1) the information provided during planning meetings is adequate, easy to understand, timely, accessible and represents the needs of the community; (2) both the political and technical leaders have the requisite knowledge and skills in planning; (3) the local government have the authority and capacity to plan, allocate resources and implement the activities, and (4) local agents listen to citizens, are honest in their interactions and provided regular feedback on how money is used in the local government (positive attitude and behavior) to influence their decision on agricultural plans and budgets (Table 2). Relatively, the same number of smallholder farmers agreed and disagreed that the local agents handle participants with respect, dignity, and fairness and motivate them during local government planning and budgeting meetings (compliance and acceptance) influenced the decision they made during the local government planning and budgeting process.

Model for prediction of pluralistic agriculture extension program (PAESP) on social governance (SG)

The developed model was significant, $X^2(48, n = 308) = 192.82, p < .001$ in testing the relationship of pluralistic agriculture extension service provision with social governance (Table 3). It clearly distinguished between respondents who strongly agreed, agreed, were not sure, and disagreed with those that strongly disagreed that the quality of pluralistic agriculture extension service affected social governance. Both Pearson, $X^2(1168) = 668.33, p = 1.00$, and Deviance $X^2(1168) = 373.41, p = 1.00$ statistics were not significant, implying the predicted responses were not significantly different from that obtained from the smallholder farmers. Therefore, the model is a good fit and can be used to predict the effect of pluralistic agriculture extension services (independent) on social governance (dependent) but with the certainty

Table 1. Responses to questions on perception of pluralistic agriculture extension service provision (PAESP).

Independent Variables	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Adequacy of facilities to extension agents.	27	197	27	29	28
Input supply to smallholder farmers.	0	39	10	82	177
Training and technology transfer.	7	156	23	33	89
Management styles of extension agents.	12	203	32	17	42
Capacity and ability of extension agents to perform.	27	197	27	29	28
Monitoring and evaluation of extension services	20	136	31	38	83

Sample size (n) = 308.

Source: Authors compilation

Table 2. Descriptive statistics of responses to social governance questions.

Dependent variables	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Information for planning	16	130	43	30	89
Knowledge and skills in planning	11	185	46	33	33
Local government capacity to plan	18	191	58	15	26
Attitude and behavior of local staff during the planning	3	158	34	34	79
Compliance and Acceptance	8	116	34	31	119

Sample size (n) = 308.

Source: Authors compilation

and Snell, and Nagelkerke respectively. The contribution of input supply, the management style of extension agents, and monitoring and evaluation of extension activities were significant ($p < .05$) (Table 3), thus confirming that the predictors were important factors in the improvement of social governance practices in local government planning and budgeting process. Wald test statistic was used to measure the effect of each PAESP factor on SG in the model. It tested if the factor significantly distinguished the level of agreement between the series of comparisons between categorical responses. In this study, the code for strongly disagree was the reference code for comparison. Table 4 is the results for comparison of strongly agree vs strongly disagree, agree vs strongly disagree, not sure vs strongly disagree, disagree vs strongly disagree. It should be noted that training, technology transfer, and monitoring and evaluation of extension services had no upper limit, meaning values of the data are not contained within the 95% confidence interval. The implication is that the probability of influence of training, technology transfer, and monitoring and evaluation of extension services on social governance is less than 5%. The model reveals that input supply significantly influenced the strong agreement of smallholder farmers that it contributed to influencing social governance. The negative odds show that smallholder farmers decreased power relations and the legitimacy of SG by 0.11. In addition, input supply significantly decreased the agreement that it contributed to power relations and legitimacy of local government

planning and budgeting process by 0.19 folds. This implies that for smallholder farmers to adequately influence decision-making during the planning and budgeting process, they need adequate quantity, the right quality, and a timely supply of physical agricultural inputs from local government and other development partners.

The management style of extension agents and monitoring and evaluation decreased power relations and increased the legitimacy of social governance by 0.38 and 2.54 times respectively. The odds value of the management style of extension agents indicates that the behavior of extension agents towards farmers regarding coordination of farming activities, motivation of farmers, and promoting effective allocation of resources decreases power relations. However, the involvement of smallholder farmers in the monitoring and evaluation of their extension activities by extension agents potentially lowers the information, knowledge, analytic skills, attitude, and behavior of smallholder farmers toward social governance. These ultimately reduce smallholder farmers' compliance and acceptance of local government planning and budgeting process. Participatory monitoring and evaluation by extension agents showed improvement in information, knowledge, analytic skills, attitude, and behavior of extension agents, and also compliance and acceptance of local government planning and budgeting process by smallholder farmers. Input supply significantly influenced the disagreement that it contributed to power relations and legitimacy of local government planning and budgeting process. The odds value of input supply

Table 3. Likelihood ratio test of the independent predictors.

Effect	Model fitting criteria			Likelihood ratio tests		
	AIC of the reduced model	BIC of the reduced model	-2 Log-Likelihood of a reduced model	X ²	df	Sig.
Intercept	670.07	849.12	574.07	119.40	8	0.000
Adequacy of facilities to extension agents	554.92	7333.97	458.92	4.24	8	0.835
Input supply	585.40	746.44	389.40	34.72	8	0.000
Training and technology transfer	563.86	742.90	467.86	13.79	8	0.106
The management style of extension agents	573.51	752.56	477.51	22.83	8	0.004
Capacity and ability of extension agents to perform	564.93	743.78	468.93	14.25	8	0.075
Monitoring and evaluation of extension services	570.76	749.80	474.76	20.08	8	0.010

Source: Author's compilation

Table 4. Estimates of parameters in the model.

Responses Independent (effects variables)		B	SE	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower bound	Upper bound
Strongly agree	Intercept	11.47	6.04	3.61	1	0.06			
	Adequacy of facilities to extension agents	0.46	0.50	0.84	1	0.36	1.59	0.59	4.27
	Input supply	-2.18	0.81	7.24	1	0.01	0.11	0.02	0.55
	Training and technology transfer	-1.72	2.87	0.36	1	0.55	0.18	0.001	50.21
	The management style of extension agents	-0.987	1.34	0.55	1	0.46	0.37	0.03	5.10
	Capacity and ability of extension agents to perform	0.228	0.94	0.06	1	0.81	1.26	0.20	7.91
	Monitoring and evaluation of extension services	-0.148	1.18	0.02	1	0.90	0.86	0.09	8.71
Agree	Intercept	5.30	3.07	2.99	1	0.08			
	Adequacy of facilities to extension agents	0.350	0.31	1.29	1	0.26	1.42	0.76	2.60
	Input supply	-1.68	0.62	7.31	1	0.01	0.19	0.06	0.63
	Training and technology transfer	-0.28	0.36	0.63	1	0.43	0.75	0.37	1.52
	The management style of extension agents	-0.96	0.44	4.87	1	0.03	0.38	0.16	0.90
	Capacity and ability of extension agents to perform	0.23	0.38	0.38	1	0.54	1.26	0.60	2.67
	Monitoring and evaluation of extension services	0.93	0.39	5.63	1	0.02	2.54	1.18	5.50
Not sure	Intercept	-73.21	1.19	3779	1	0.00			
	Adequacy of facilities to extension agents	0.37	0.27	1.96	1	0.16	1.45	0.86	2.44
	Input supply	14.4	0.00	.	1	.	1824291.75	1824291.75	1824291.75
	Training and technology transfer	-0.24	0.34	0.50	1	0.48	0.79	0.41	1.52

Table 4. Contd.

	The management style of extension agents	-0.29	0.31	0.87	1	0.35	0.75	0.41	1.38
	Capacity and ability of extension agents to perform	0.03	0.34	0.01	1	0.93	1.03	0.53	1.10
	Monitoring and evaluation of extension services	0.35	0.33	1.12	1	0.29	1.42	0.74	2.71
	Intercept	-123.56	5137.02	0.00	1	0.98			
	Adequacy of facilities to extension agents	-0.116	0.77	0.02	1	0.88	0.89	0.20	4.04
	Input supply	-2.93	1.52	3.71	1	0.05	0.05	.003	1.05
Disagree	Training and technology transfer	14.22	719.86	0.00	1	0.98	1495823.9	.000	.b
	The management style of extension agents	0.915	1.47	0.39	1	0.53	2.50	.141	44.17
	Capacity and ability of extension agents to perform	0.378	0.70	0.29	1	0.59	1.46	.369	5.77
	Monitoring and evaluation of extension services	12.01	733.05	0.00	1	0.99	164507.15	.000	.b

Source: Author's compilation

showed decreased power relations and legitimacy of local government planning and budgeting process by 0.05. Inadequacy of the quantity, poor quality, and untimely supply of physical agricultural inputs that do not meet the needs and requirements of smallholder farmers lowers the information and knowledge, analytical skills, attitude and behavior, capacity, and skills in production, value addition, and marketing. These result in a lack of compliance and acceptance of local government planning and budgeting process by smallholder farmers. However, training and technology transfer and participatory monitoring and evaluation of extension services showed infinite upper limits. To those who disagreed these factors should not have limits in pluralistic agricultural extension service provision, meaning they need to be provided at all times. Model results confirmed that compliance and acceptance of local government planning and budgeting process is stimulated by the pluralistic agricultural extension services. The quality of pluralistic agriculture extension service is significantly determined by physical agricultural input supply,

the management style of extension agents, participatory monitoring, and evaluation of extension services. These factors increase information and knowledge, analytical skills, attitude and behavior, capacity, skills in production, value addition, and marketing of smallholder farmers' produce.

DISCUSSION

The economic liberalization of the 1980s under the structural adjustment program in Uganda withdrew the government from economic activities such as input supply, marketing, and direct agricultural production, and decentralization transferred selected public responsibilities to local-level institutions, such as farmer cooperatives, private service providers, non-governmental organizations and public agencies (Rivera, 1996; Anderson, 2008) with the hope to enforce smallholder farmer socioeconomics. How these have performed is yet unclear. Our study assessed the influence of independent variables

(PAESP) on the dependent variables (SG). This was to understand the key factors in the dynamics of the National Agricultural Advisory Service (NAADS) and Farmer Field Schools (FFS) in Uganda. The design of PAESP models like NAADS and FFS affects smallholder farmer social governance practices of local government planning and budgeting process. In this study, the farmers strongly agreed that input supply was significantly associated with the legitimacy and power of social governance, although there was less than a unit-fold change in the perceived legitimacy and power. The adequate, available, and reliable physical agricultural input supply increase technological change in terms of improved inputs use (Hu et al. 2022). These are important for increased agriculture productivity, income, and improved food security situation of smallholder farmers (Mozumdar, 2012), and provide an incentive to participate in the local government planning and budgeting process (Umata, 2013). Motlhanke et al., 2021 and Li and Hunter 2015 reported that resource ownership and power bring respect and confidence to

smallholder farmers to deliberate during planning and budgeting meetings with the hope of influencing an increase in resource allocation. Poor input quality is therefore a disincentive for compliance to participation in local government planning and budgeting process. Thereby, if the local agents take decisions on agricultural development strategies without integrating smallholder farmers' needs and priorities, there is a continued waste of time and resources in the enterprises that do not meet household priorities and needs. The importance of providing physical agricultural inputs with the right quality and quantity and at the right time to smallholder farmers is that this will enable the smallholder farmers not only to motivate them to participate in local government planning and budgeting process but also improve their individual on-farm performance. The management style of extension agents revealed a negatively significant lower (less than half-fold) improvement in the behavior of extension agents in promoting good relationships with farmers, coordination of farmer's activities, motivation of farmers, organization of farmer activities, communication, and feedback on farmer's activities. Thus, farmers are less likely to participate in local government planning and budgeting process. These lessen the bottom-up demand driver of farmer service delivery, farmer-centered planning, and accountability with limited smallholder farmers' capacity to share credible information required to help the interaction during planning meetings (Kabir et al., 2020); consequently, impacting on the smallholder farmers' effective voice in the planning and budgeting process. The interaction between extension agents and smallholder farmers contributes to social learning processes that help in transforming the norms, rules, and power relationships needed to improve farmers' activities (Rist et al., 2007). Given that the extension agents are not able to broker information and build a strong bridge between smallholder farmers and sources of technologies, and together with their inadequate interaction or linkage, they have failed to fulfill their role in strengthening farmers' capacity and achieving agricultural growth at the local level (Ragasa et al., 2016). The need for strengthening extension agents' attitudes and skills to promote innovation, learning, negotiation, network building, social learning, and dealing with dynamics of power and conflict is important in improving the relationship between smallholder farmers and extension agents (Usadolo, 2020).

Farmers were in agreement that participatory monitoring and evaluation of extension activities were positive and are significantly associated with their compliance. This has approximately two and a half folds in the improvement of information, knowledge, analytical skills, attitude, and behavior of extension agents, and also compliance and acceptance of local government planning and budgeting process by smallholder farmers. We note the change in social governance (SG) as a result of participatory monitoring and evaluation is only 5%. This

implies that smallholder farmers who are not involved in the monitoring of their own activities by extension agents cannot adequately share knowledge and information among themselves and the extension agents, thus are unable to participate in the discussions, negotiations, and joint planning with the extension agents. The smallholder farmers fail to identify their priorities and need due to inadequate information for proper farm decision-making on activities. The follow-up of farming activities by extension agents together with smallholder farmers and the provision of feedback to smallholder farmers inform future decisions on extension services and the acquisition of credible and useful information influence decision-making during planning and budgeting meeting (Holland and Ruedin, 2012). This suggests the importance of information in power relations. Govender (2013) argues participatory monitoring and evaluation ensure effective and efficient management of resources by both local government agents and smallholder farmers, thus increasing compliance and acceptance of the local government planning and budgeting process. This enables the smallholder farmers to raise their issues during public discussion and force local government agents to integrate them (Evans et al., 2019). When extension agents provide regular information, it enabled smallholder farmers to achieve outcomes of their farming activities and adequately coordinate with group leaders, farmer meetings, and other avenues of information dissemination (Duram and Brown, 1999). By promoting the flow of information and material inputs between extension agencies and smallholder farmers, training and technology transfer reinforced local power relations, increase access to profitable opportunities, and produce political legitimacy in the local planning and budgeting process (Taylor and Bhasme, 2018). These allow farmers to access information on issues and knowledge in agricultural activities and the local planning processes (Reed, 1997). The ultimate results are increased capacity to participate, comply and accept that the local decision-making process is aimed at improving their well-being. Legitimacy can also be realized when citizens are willing to accept the decisions and actions of local government even if they do not correspond with their individual preferences or objectives (Peter, 2010). This is achieved when citizens trust that local government provides adequate services, perceive the quality of administration as better; and that bureaucrats are responsive and accountable for their actions (Deephouse and Suchman, 2008; Gustavsen et al., 2014). In the absence of information and coordination of farming activities, smallholder farmers cannot deliberate and negotiate during planning meetings, and therefore cannot comply and accept that the local government planning and budgeting process is aimed at improving their livelihoods.

This study did not identify and separate the smallholder farmer group members who participated in NAADS or FFS only from those who benefited from other extension

service provision models. It is therefore difficult to know which one had a significant relationship with farmers' compliance with the local government planning and budget processes. Farmers also participated in other agricultural development programmes with expectations of benefiting from them. In this regard, to allow smallholder farmers to achieve their goals, local governments need to focus their plans and resource allocation on increasing input supply, improving communication and coordination activities, and monitoring and evaluation activities of smallholder farmers. All predictor factors with a negative coefficient can lead to a loss of trust, confidence, and compliance with the local government planning and budgeting process, although it is usually aimed at improving farming performances. The redesign of pluralistic agricultural extension service models should therefore enforce an increase in power relations in and legitimacy of the local planning and budgeting process. I also acknowledge that our study could explain approximately 50% of compliance with local government planning and budgeting processes. More farmer variables need to be investigated to attain a complete linkage between smallholder farmers and local government governance.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interest.

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