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Agricultural Extension Needs of Frontline Extension Workers under a Pluralistic Advisory System: Case of Zimbabwe Agricultural Growth Program

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Abstract

Compartmentalized extension prohibits the uptake of new technology thereby inhibiting agricultural growth. Extension services aimed at increased agricultural growth should have a market-led and evidence-based pluralistic advisory system that is coordinated by the government's Agricultural and Technical Services division in response to the needs of farmers. This study sought to assess extension needs of government front line extension workers. The research was conducted in four districts of Zimbabwe. The research used a mix of qualitative and quantitative methods, including a survey and focus group discussions. The Competency Borich Needs Assessment Model to assess the extension competence needs was adopted. The results revealed that the extension officers were slightly above moderate level of competency in 10 of the 21 agricultural competencies and at moderate level in 1 of the 21 agricultural competencies. Regarding the required level of agricultural competencies needed by extension workers, the results showed a fairly high total mean level (TM = 3.45). Therefore, the extension workers believed that agricultural competencies were moderately needed to be improved. There is greater need to spruce up technical, extension and organizational competencies within the whole structure of Agricultural extension front line staff.

Keywords: Agricultural extension , Needs, Pluralistic competencies

1. Introduction

The agricultural extension services sector needs to be remodeled to promote a participatory system that embraces the public and private sector extension providers, farmers and their organisations and other actors in the agricultural value chain. As part of the multi - stakeholder Agricultural Knowledge and Innovation Platforms (AKIPs) that are intended under the new institutional integration measures, extensionists should be able to seamlessly incorporate research products and farmers' knowledge and deploy extension methods that cast them as development facilitators to improve the content and efficacy of their work (Pazvakavambwa, 1994). Compartmentalised extension prohibits the uptake of new technology. For example, climate-resilient maize yields up to 20% more than older commercial varieties (Setimela et al., 2017). However, access to relevant extension services is one of the main barriers to its adoption (Holden and Fisher, 2015). Government extension providers must assume a coordinating role to overcome the challenge of fragmentation and the high extension to farmer ratio of 1:800.

Through its backward linkages with agricultural education and research, agricultural extension should incorporate specialist areas that are not conventionally provided such as business planning and management, marketing, financing, legal advice among other areas. Collaborative extension will bring together diverse stakeholders,

especially women and the youth, who constitute the bulk of farmers, and create feedback loops between users and generators of knowledge and innovation services (Pazvakavambwa, 1994). Through in-service training, extension providers will be equipped to formulate their messages based on agro-ecological realities, and farmer-types and groups to improve geographical and social relevance and exploit regional comparative and competitive advantages. Gender sensitive messaging will help address the disparities that exist in access to extension and information in Sub Saharan Africa (Rivera and Gustfson, 1991). The use of ICT will further enhance access to extension services and facilitate interaction between the various service providers. These interventions are designed to deliver an inclusive, market and business-facing, and a private sector and community-driven extension system at output level. The transformation in the delivery of extension services in the context of an integrated knowledge and innovation system will deepen and expand the relevance and efficiency of extension; improve the adoption of research products based on the needs of value chain actors; and enhance the overall performance of agricultural value chains (Goz, 2006)

The Zimbabwe Agricultural Growth Program (ZAGP) project aimed to have a market-led and evidence-based pluralistic extension services that are coordinated by the government's Agricultural and Technical Services (Agritex) in response to the needs of farmers. However, the scope and reach of public agricultural extension service has been compartmentalized and declining over the past decades. Extension staff has limited opportunities for continued professional development, both at technical levels for agricultural production and for exposure and training in new and dynamic modes of extension. It has remained traditional that government-led extension is still the main source of information for most smallholder farmers, but this is constrained in practice by severely limited mobility for most extension workers. Nongovernmental organizations (NGOs), unions and private sector are also delivering extension for specific projects or value chains, but these are disjointed from one another with no central oversight or coordination of themes, approaches and messaging, (Rivera, W. M., and Gustafson, D. J., 1991). It is against this background that this study carried out agricultural extension needs assessment for the Ministry of Lands, Agriculture, Water, Climate and Rural Settlement's extension departments in Zimbabwe and came up with possible career development pathways. The objective of the study was to assess extension competence needs of government front line extension workers.

2. Materials and methods

The research used a mix of qualitative and quantitative methods, including a survey and focus group discussions. This approach integrates social science disciplines with predominantly quantitative and qualitative approaches to theory, data collection, data analysis and interpretation. The purpose of doing this was to strengthen the reliability of data, validity of the findings and recommendations, and to broaden as well as deepen understanding of the agricultural extension competence needs in the study area.

The research was conducted in four districts, namely Mhondoro-Ngezi, Chegutu, Matobo and Insiza. Mhondoro-Ngezi and Chegutu districts are in Mashonaland West province, where as Matobo and Insiza are in Matebeland South province. The study population was constituted by Agricultural Extension Worker (AEWS). Data were collected through questionnaires, structured interviews and focus group discussions. About 50 percent of the extension workers in each district were randomly selected. A total of 126 extension workers were randomly selected from the sampling frame of extension workers who were dotted in 4 districts in the provinces, reflecting the geographical distribution of the group across the two provinces. The questionnaire was developed following consultation with a wide range of experts and an extensive literature review. The questionnaire was administered to the AEWs at a central location (e.g. Agritex offices). The extension competence[1] needs identified for the study were divided into four major components namely agriculture (technical), extension, communication and personal competencies. Specific extension competence needs variables (items) were included under each major extension competence needs component. Likert-type responses with five scales were used to assess different sections of the questionnaires.

Data cleaning was done by running frequencies of selected key variables to identify misplaced data to be rectified before data analysis began. For extension workers' questionnaires' reliability was tested with Cronbach's Alpha technique.

Qualitative data analysis was done using content analysis, quasi statistics and logical analysis. The content analysis method includes three techniques- summarizing, explicative, and

1. Competencies are the application of knowledge, technical skills, and personal characteristics leading to outstanding performance (Hayward, 1990).

structuring. In the summarizing content analysis technique, items with the same concepts and ideas are reduced (first reduction) and common ideas are summarized and categorized (second reduction). The main idea of this technique is the reduction and summarization of the text (Flick, 2006). After data collection, the Survey Team converted all qualitative interviews into Microsoft Word transcripts. These constituted the qualitative raw data for analysis. Data was analyzed through quasi-statistics specifically qualitative content analysis. Responses were classified into broader themes and findings and conclusions were based on the frequency with which an issue was mentioned across different interviews. The approach facilitates quantification of qualitative outcomes and reduces possibilities of minority opinions being generalized as fact.

Training needs were assessed using the Borich model (1980), one of the most widely used models for assessing training needs in agricultural education and extension. Following this model, a weighted discrepancy score was calculated for evaluation and ranking of extension workers' training needs.

A Mean Weighted Discrepancy Score (MWDS) was calculated to describe the overall rankings for each of the training needs. The competencies with the highest scores were those with the highest need and priority for training. To determine discrepancy scores, weighted discrepancy scores and mean weighted discrepancy scores, the following procedures were followed. First, the ability (self-assessment) rating was subtracted from the importance rating to determine the discrepancy score for each individual on each training need. Next, the discrepancy score was multiplied by the mean importance rating to calculate the weighted discrepancy score on each individual for each training need. A mean weighted discrepancy score for each of the competencies was then calculated by taking the sum of the weighted discrepancy scores and dividing by the number of observations. Using the mean weighted discrepancy scores, the competencies were then ranked.

3. Results and discussion

3.1 Socio-demographic characteristics of extension workers (respondents)

Table 1 shows the personal characteristics of survey respondents. Descriptive findings from the extension workers' questionnaire showed that 53 percent of extension workers were women, which tends to mirror the gender composition of the extension workers. The age distribution of respondents was skewed towards 40s, with slightly high representation found in the 46 to 50 (28 percent) category, which is followed by 41 to 45 category (25 percent).

The study revealed that the majority of the respondents had attained certificate level (46 percent) and few respondents had completed bachelors' degree. About four of the certificate holders were supervisors out of sixteen supervisors interviewed. These findings suggest that many extension workers in the target districts have low qualification, which will impact on their ability to deliver extension services. It seems from the findings that promotion to Supervisor is not based on qualification within Agritex.

Table 1. Distribution of respondents according to selected personal characteristics

Characteristic	Frequency	Percentage
Gender		
Female	67	53
Male	59	47
Age		
31-35	26	21
36-40	18	14
41-45	31	24
46-50	35	28
51-55	9	7
56-60	7	6
Education		
Certificate	57	45
Diploma	52	41
Bachelors' degree	16	13
Masters' degree	1	1
Work experience		
Less than 5	1	1
5-10	36	28
More than 10 years	89	71

3.2 Agricultural Competencies

The agricultural competencies were divided into 21 items with Likert-type five-point questions. As shown in Table 2, extension workers perceived themselves as possessing an average, or better ability (current competencies) (M=3.01) to perform agricultural competencies. The mean values of extension workers' perceived ability to perform agricultural competencies ranged from 2.27 to 3.75. Furthermore, respondents indicated that they had the highest ability to perform the fertilizer application competency (M = 3.75; SD = 0.89) and the least ability to perform the surveying and topography competency (M = 2.27; SD = 1.05). The results revealed that the extension officers were slightly above moderate level of competency in 10 of the 21 agricultural competencies and at moderate level in 1 of the 21 agricultural competencies. Regarding the

required level of agricultural competencies needed by extension workers, the results showed a fairly high total mean level (TM = 3.45). Therefore, the extension workers believed that agricultural competencies were moderately needed to be improved.

Overall, the MWDS ranged from a high of 6.63 for the surveying and topography competency to a low of -2.50 for the fertiliser application competency. About 76.2 percent of the agricultural competencies possessed positive MWDS, whereas 23.8 percent had negative scores. The five competencies which had negative MWDS included: farm management (MWDS= -0.33), pest identification and management (MWDS=-0.53), farming of different crops (MWDS= -1.17), weed identification and management (MWDS= -1.40) and fertilizer application (MWDS= -2.52). The negative MWDS indicated that the extension workers' perceived ability to perform each competency was higher than the perceived levels of importance of the associated competency.

Agricultural competencies in need of improvement (training) were ranked from high to low using the MWDS. The MWDS indicated that 6 of the 21 competencies were in greater need for in-service training. The 6 highest rated competencies had MWDS greater than 3.0 and were as follows: surveying and topography (6.63), diagnosis of animal diseases (MWDS = 4.4), diagnosis of plant diseases (4.14), new issues in agriculture (MWDS = 3.53), designing agricultural projects (MWDS =3.25) and biology and morphology of plants (MWDS = 3.06).

3.3 Extension competencies

As presented in Table 3, The results indicated that the total mean value of the extension workers perceived 21 extension competencies was higher than average at the current status (ability) (TM = 3.12). Competencies such as apprenticeship skills (M=2.94), youth and women approach (M = 2.83), data processing and analysis (M= 2.74), curriculum development (2.67), conducting research studies (2.61) and audio-visual design (M= 2.29) had mean values less than moderate. This means that the extension workers believed that they were less competent in the 6 extension competencies.

Table 2. The Agricultural training needs of extension workers in rank order of MWDS

Agriculture competencies	Current level of competency		Desired competency		MWDS	
	Mean	Std. Deviation	Mean	Std. Deviation	Score	Rank
Horticulture and gardening	3.30	0.67	3.40	1.089	0.32	15
Farming of different crops	3.56	0.70	3.20	1.081	-1.17	19
Sustainable agriculture	3.23	0.80	3.30	1.154	0.24	16
Agricultural economics	2.90	0.98	3.57	1.203	2.41	10
Farm management	3.34	0.87	3.24	1.268	-0.33	17
Designing agricultural projects	2.73	0.96	3.63	1.225	3.25	5
Farm operations	3.15	0.94	3.32	1.211	0.55	13
Tillage machinery	2.87	1.03	3.56	1.256	2.43	9
Food & processing conservation	2.62	1.11	3.47	1.191	2.95	8
Agricultural marketing	3.10	.87	3.34	1.093	0.74	12
Biology and morphology of plants	2.73	1.08	3.62	1.123	3.06	6
Irrigation management	3.03	2.69	3.60	1.122	1.96	11
Weed identification and management	3.55	.92	3.10	1.269	-1.40	20
Pest identification and management	3.33	.84	3.18	1.214	-0.53	18
New issues in agriculture	2.64	1.01	3.63	1.202	3.53	4
Diagnosis of plant and animal diseases	2.61	0.95	3.74	1.149	4.14	3
Diagnosis of animal diseases	2.53	1.04	3.74	1.151	4.40	2
Fertilizer application	3.75	.89	2.90	1.250	-2.52	21
Animal husbandry	3.14	.85	3.34	1.218	0.55	13
Surveying and topography	2.27	1.05	3.98	1.150	6.63	1
Soil science	2.78	0.93	3.63	1.161	2.95	7
Total Mean	3.01	1.01	3.45	1.18	1.63	

Table 3. The extension training needs of extension workers in rank order of MWDS

Extension competence	Current level of competence		Desired competency		MWDS	
	Mean	Std. Deviation	Mean	Std. Deviation	Score	Rank
Writing skills	3.77	.905	2.80	1.374	-2.71	22
Diffusion of innovation	3.28	.873	3.31	1.223	0.11	10
Conducting of extension courses	3.41	.772	3.06	1.279	-1.09	16
Agricultural extension	3.85	.760	2.91	1.327	-2.73	23
Writing media design and production	2.24	1.113	3.75	1.232	5.65	1
Teaching skills	3.53	.864	3.17	1.297	-1.13	17
Management in extension	3.40	.781	3.14	1.178	-0.80	15
Adult education skills	3.51	.837	3.04	1.203	-1.42	19
Current issues in extension	3.02	.848	3.29	1.167	0.91	9
Psychology in extension	2.81	.892	3.31	1.210	1.65	8
Communication in extension	3.59	.783	2.96	1.261	-1.86	21
Rural sociology	3.19	1.033	3.16	1.196	-0.10	12
Curriculum development	2.67	.828	3.32	1.086	2.13	5
Extension programming	3.17	.883	3.17	1.132	0.03	11
Agricultural education	3.36	.743	3.18	1.120	-0.56	13
Apprenticeship skills	2.94	.953	3.39	1.138	1.76	7
Youth and women education skills	2.83	1.074	3.38	1.245	1.88	6
Participatory approaches in extension	3.25	.846	3.02	1.220	-0.69	14
Extension approaches	3.49	.746	2.96	1.267	-1.57	20
Conducting research studies	2.61	.988	3.51	1.313	3.15	3
Conducting group sessions and problem solving	3.45	.835	3.06	1.254	-1.21	18
Data processing and analysis	2.74	1.037	3.52	1.185	3.04	4
Audio-visual design and use	2.29	.979	3.60	1.181	4.71	2
Total Mean	3.12	0.884	3.22	1.221	0.40	

Table 4. The communication training need of extension workers in rank order of MWDS

Communication Competencies	Current level of competence		Desired competency		MWDS	
	Mean	Std. Deviation	Mean	Std. Deviation	Score	Rank
Individual communication	3.73	.871	2.86	1.301	-2.49	8
Internet skills	2.57	1.148	3.58	1.388	3.61	4
Computer skills	2.63	1.041	3.63	1.287	3.66	3
Social communication	3.48	.817	3.06	1.325	-1.26	6
Team work skills	3.60	.887	2.86	1.294	-2.11	7
ICT skills	2.42	1.134	3.71	1.259	4.77	1
Leadership skills	3.32	.855	3.13	1.273	-0.57	5
e-learning skills	2.50	1.041	3.70	1.222	4.43	2
Total Mean	3.03	0.974	3.32	1.294		

Table 5. The personal training needs of extension workers in rank order of MWDS

Extension competence	Current level of competence		Desired competency		MWDS	
	Mean	Std. Deviation	Mean	Std. Deviation	Score	Rank
Responsibility	3.87	.870	2.76	1.304	-3.04	14
Interaction	3.73	.901	2.81	1.299	-2.56	13
Motivation	3.52	.977	2.86	1.343	-1.90	6
Adaptability and adjustability	3.58	.880	2.92	1.256	-1.92	7
Enthusiasm	3.18	.889	2.96	1.267	-0.66	3
Decision making ability	3.69	.795	2.82	1.242	-2.46	12
Problem solving skills	3.51	.831	3.58	4.615	0.35	1
Work ethics	3.48	.839	3.25	3.801	-0.65	2
Self-competencies	3.64	.890	2.87	1.252	-2.21	9
Leadership	3.67	.818	2.90	1.261	-2.24	10
Personal work experience	3.69	.815	2.90	1.225	-2.30	11
Creativity	3.55	.826	2.87	1.356	-1.94	8
Critical thinking	3.52	.787	2.13	1.433	-1.63	5
Market awareness	3.38	.757	2.97	1.258	-0.77	4
Total Mean	3.57	0.848	2.9	1.708		

For the required level of extension competencies, the results showed that the total mean value (TM =3.22) was above average. The mean values of extension workers' perceived levels of the required competencies of the 21 extension competencies ranged from 3.75 to 2.80.

MWDS of extension competencies ranged from 5.65 to -2.73. The Borich model, indicated that 4 of the 23 extension competencies were in greater need for training (Table 3). The 4 highest rated competencies had MWDS greater than 3.0. The 4 competencies included: writing media design and production (MWDS = 5.65), audio-visual design and use (MWDS = 4.45), conducting research studies (MWDS = 3.15) and data processing and analysis (MWDS = 3.04).

3.4 Communication competencies

As presented in Table 4, the current competency total mean of the extension workers' communication competencies was moderate (TM = 3.03). This indicated that the extension workers felt that they had a relatively satisfactory level of communication competencies needed. The mean values of extension workers' perceived levels of ability (current competencies) of 8 communication competencies ranged from 2.42 to 3.73. Four current competencies had mean values that were less than 3.0, and therefore, were perceived to have a below average level of competency: computer skills (M = 2.63), internet (M= 2.57) e-learning skills (M=2.50) and ICT skills (M=2.43) (Table 5). Individual communication (M= 3.73), team work skills (M= 3.60), social communication (3.48) and leadership (M= 3.32) were the top four competencies highly possessed by the extension workers as perceived by respondents.

Concerning the desired level of communication competencies needed, the results indicated that the total mean was above moderate level (TM = 3.32). Accordingly, communication competencies such as ICT (M = 3.71), e-learning (M = 3.70), computer skills (M=3.6), internet skills (M = 3.58).leadership (M = 3.13) and social communication (M=3.06) were felt to be as the most important competencies required by the respondents as their mean values were above moderate.

Using the Borich model, four communication competencies were deemed to be needed for training since their MWDS were above 3.0. The 4 competencies included: ICT (MWDS = 4.77), e-learning skills (MWDS = 4.43), computer skills (MWDS = 3.66) and internet skills (MWDS = 3.61).

3.5 Personal Competencies

As displayed by Table 5, the total mean value (3.57) of current personal competencies was higher than moderate. All 14 personal competencies had mean values above 3.0. The results about the required personal competencies indicated that the total mean value (2.9) was less than 3.0. This showed that the level of requirement of the 14 personal competencies was below moderate.

The results revealed that only one of the 14 personal competencies had a positive score (MWDS = 0.35) and the rest had negative MWDS (Table 6). The negative MWDS indicated that the extension

workers' perceived ability to perform each competency was higher than the perceived levels of required of the associated competency. Since problem solving was the only competency with a positive MWDS less than 3.0, there was no area of improvement needed (training need) in this category. The possible reason could be attributed to the extension workers' vast experience as results indicated that on average the responded had more than 10 years in service. Personal competencies can be perfected as employees gain experience.

3.6 Extension challenges encountered by AEW

AEW offers the widest coverage of extension services and its operational strength faces a variety of challenges. The difficulties range from personal, occupational, operational and competencies among other challenges. The following challenges narrated by respondents were given the same priority weighting;

Mobility – transport

Communication

Lack of incentives such as Travelling and Subsistence allowances

Lack of protective clothing

Inadequate stationery/office equipment

Lack of in-service courses to update on new technologies

Suggestions for future improvement of Agricultural extension (effective and efficient) delivery system

Agricultural extension workers need a lot of support and motivation in order to offer meaningful service delivery to the whole range of farming community. Suggestions for future improvement of agricultural extension were given as follows;

Provision of motor cycles (transportation).

Provision of computers and Internet.

Conducting regular short courses.

Provision of equipment like livestock and crop kits.

Provision of decent accommodation.

Other Services needed to enhance extension delivery.

Extension delivery is always targeted at enhancing food security at household and community level. As such, in addition to right competencies in extension staff, the operational context (farming community) also need the right mix of services as given below;

Provision of Tillage equipment for farmers

Supporting schemes for farmers to get farming loans

Market oriented agricultural production

4. Conclusions and recommendations

The needs assessment study concluded that the requisite technical and extension competencies needed by front line extension staff for efficient and effective service delivery in the selected districts, need greater sprucing up in technical, extension and organisational competencies within the whole structure of staff. Context specific factors that impinged on effective extension delivery within a pluralistic extension environment where also listed. Poor delivery of extension service was linked to absence of operational resources, staff incapacitation across the board, inhuman living conditions and lack of motivational incentives. In-service training programmes and obligatory courses, should be an ongoing process. There is also need to support production of relevant extension training materials and decentralise implementation of extension programmes.

Government-led extension is still the main source of agricultural information for most smallholder farmers in Zimbabwe. Extension service has been constrained in practice by sketchy resource allocation for most extension workers. Extension staff need opportunities for continued professional development in knowledge and technical skills for agricultural production and exposure to dynamic participatory modes of extension in a pluralistic agricultural advisory environment through strategic capacity building.

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