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Full Length Research Paper

Analyzing Determinants of Development Agents' Motivation in Agricultural Extension Services Provision: A Case from South West Shoa Zone, Oromia Regional State, Ethiopia: An Ordered logit Regression Model approach

Dessalegn Gachena Negera

College of Agriculture and Natural resources, Department of Agricultural Economics, Wolkite University, P.O. Box 07,Wolkite, Ethiopia.
E-mail:gachena2012@gmail.com,Tel:+ 251-0923-204600

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This study was confined to assess the work motivational level of development agents (DAs) and the factors affecting their work motivation in the five Districts of South West Shoa Zone, Oromia Regional States, Ethiopia, with a sample size of 124 development agents. Work motivational level of DAs was measured with a self- evaluation questionnaire method. Both quantitative and qualitative data were collected using structured questionnaire and focus group discussion respectively. Descriptive and inferential statistics were employed to analyze the data. The ordinal logistic regression model was used to analyze the variables determining Development Agents work motivation. The study found that about 58% of Developments belonged to the medium level of work motivation, followed by 21.8% and 20.1% belonging to low and high level of work motivation, respectively. Results of the model showed that, of the total nineteen independent variables included in the model, eight variables were found to be significantly affecting Development Agents motivation in Extension Services Provision. Among other, work location, work incentives, job security, supervision system, job description, Performance appraisal systems, policy environment and attitude of DAs towards their job are significantly affecting work motivation of Development Agents in the study area.

Key Words: Development agents, extension services, level, work motivation, ordered logistic regression.

INTRODUCTION

The Development Agent is the primary source of agricultural information that small holder farmers depend upon for production information in Ethiopia. Agricultural extension service is the foundation for any meaningful development in agricultural sector. Hence, development agents are the critical actors in serving the community and expected to change farmers' knowledge, skill and attitude through communicating up-to-date information necessary in taking informed decisions towards improving their livelihood (Gebrehiwot et al., 2012).

Studies conducted in different parts of Ethiopia (SNNP, Tigray and Amahara regions) noted that the low morale, low mobility and high turnover were the related problem of extension services. Serious shortage of operational budget is another problem that affects the extension services and also the morale of extension personnel (Azage *et al.,* 2006).

The weak capacities of experts and extension agents to demonstrate technological packages and offer adequate technical assistance to farmers, top–down approach, low morale and high turnover of extension staff, lack of motivation and shortage of operational budget and facilities were among the related problems of agricultural extension in the country (Belay and Degnet, 2004). Additionally, the effectiveness and efficiency of extension service is contingent upon the overall policy environment and conductive working environment for contributing to the development of the skill and knowledge of farmers to adopt improved technologies. The same source more elaborately added, the actual utility of job descriptions in extension

organizations is complicated by factors such as work overload, seasonality of extension, the range of cropping systems, and distribution of extension service over a large area. Extension agents face work related problems such as role ambiguity and lack of job authority, expertise and accountability. Hence, under these conditions, DAs cannot be expected to give a dedicated and efficient extension services to the farming community. In contrary to this fact, extension is based on confidence of the farmers in the competence of the extension agents and in their motivation to help the farmers to realize their goals (Van den Ban and Hawkins, 1996). Extension organizations however, in developing countries face the major problems of professional incompetence and lack of motivation among their employees (Vijayaragavan and Singh, 1989).

The effectiveness of agricultural extension work highly depends on the availability of extension professionals who are qualified, motivated, committed and responsive to the ever-changing social, economic and political environment (Haile and Abebaw, 2012). However, though all performance problems of extension services are not explained solely by lack of work motivation among DAs, it took the larger contribution. This calls for identifying the level and the potential factors determining DAs work motivation in the study area.

Thus, the objectives of this particular study were to evaluate the level of work motivation and identify factors determining development agents' motivation in providing agricultural Extension Services in South West Shoa Zone, Oromia Regional State, Ethiopia.

METHODOLOGY

Description of the Study Area

The study area, South West Shoa zone, is one of the twelve zones in O rom ia region. The Zone comprises eleven districts. The agro ecology is woinadega or midland. Most agriculture is rain fed although there is some irrigation. Crop production and livestock rearing are the main economic activities. The soil in the zone is clay/loamy and is fertile. June to September is the main rainy season. The zone receives annual rainfall in the range of 900mm – 1200mm.

Sample Size and Sampling Procedure

All the development agents (a census of DAs) of the eleven Districts with a total sample size of 124 DAs were included in the sample as the respondents of the study. As per the interest of the research sponsors, South West Shoa was selected purposely. Due to limited financial support for the study, only five Districts having maximum number of development agents were selected for the analysis.

Types and Methods of Data Collection

For this research both primary and secondary data sources were used. Primary data were collected from the sampled respondents (DAs) in the study areas, while Secondary data were obtained from various sources such as reports, records of DAs from the study district Administrative office of Agricultural and Rural Development (WOARD, 2003), pervious findings, internet and other published and unpublished materials.

Quantitative data were collected through structured questionnaire. Questionnaire was pre- tested among the non-sampled respondents of matching characteristics and depending on the results of the pre-test; it was revised in the light of suggestions received. Finally the modified questionnaire was used for the collection of data on the study. Direct contact with all respondents was made and they were explained the reasons for research, the possible benefits and they were assured of total anonymity and privacy of opinions revealed in the questionnaire, which was distributed among the respondents and collected back.

Qualitative data were used to supplement and to fill gaps during the quantitative data collection process. Qualitative data were collected through focus group discussions using focus group discussion guide questions by the researcher. Seven group discussions were carried out.

Method of Data Analysis

Generally descriptive statistics and econometric model were employed to study the relationship between the dependent and explanatory variables of the study.

Descriptive statistics; Descriptive statistics like mean, standard deviations, frequencies, percentages and cross-tabulations were used to analyze the level of work motivation among DAs in the study area.

The econometric model

Ordinal Logit econometric model was used for this study because response categories are ordered but do not form an interval scale. Responses like these with ordered categories cannot be easily modeled with ordinary linear regression because of the non interval nature of the dependent variable. On top of this, multinomial Logit or Probit models would fail to account for the ordinal nature of the dependent variable (Green, 2000). Ordered Logit or Probit econometric model would therefore, be deemed appropriate to analyze such data.

According to Green (2000) the ordered logit model regression equation takes the form:

y^* = is unobserved and thus can be thought of as the underlying tendency of an observed phenomenon.

$y = 1$ if $y^* \leq \mu 1$ (=0)

$y = 2$ if $\mu 1 < y^* \leq \mu 2$

$y = 3$ if $\mu 2 < y^* \leq \mu 3$

(2) $y = j$ if $\mu j\text{-}1 < y^*$

Where y is observed in j number of ordered categories, μs are unknown threshold parameters separating the adjacent categories to be estimated with βs.

The general form for the probability that the observed y

Table 1. Level of work motivation among DAs the study area.

work motivation category	score	frequency	percent	mean
low	13-17	27	21.8	
medium	18-27	72	58.1	
high	28-35	25	20.2	3.2

Source: Own computation from survey data, 2013.

falls into category j and the μs and the βs are to be estimated with an ordinal logit model is Where L (·) represents cumulative logistic distribution

Marginal effects on the probabilities of each work motivation category were calculated by Where f (·) represents the probability density function like logistic regression, ordered logit uses maximum likelihood methods, and finds the best set of regression coefficients to predict values of the logit-transformed probability that the dependent variable falls into one category rather than another. Logistic regression assumes that if the fitted probability, *p*, is greater than 0.5, the dependent variable should have value 1 rather than 0. Ordered logit doesn't have such a fixed assumption. Instead, it fits a set of cutoff points. If there are *r* levels of the dependent variable (1 to *r*), it will find *r*-1 cutoff values k_1 to k_{r-1} such that if the fitted value of logit (*p*) is below k_1, the dependent variable is predicted to take value 0, if the fitted value of logit (*p*) is between *k*1 and *k*2, the dependent variable is predicted to take value 1, and so on (Bruin, 2006).

Statistical tests of multicollinearity problem

Before executing the econometric model, all the hypothesized explanatory variables (R_i) were checked for the existence of multicollinearity. If there is collinearity between the independent variables, we cannot separate out the effect of each parameter estimate on the dependent variable. It is quite difficult f o r us to estimate accurately the effect of that variable. Consequently, we may have little confidence in any policy prescriptions on these estimates. It is thus, important to test for the presence of collinarity between variables before running a regression. Different methods are often suggested to detect the existence of multicollinearity problem. Although there are various indicators of multicollinearity, no single diagnostic will give us a complete handle over the collinearity problem (Gujarati, 2003). For continuous explanatory variables a technique of variance inflation factor (VIF) was employed to detect the problem of multicollinearity (Gujarati, 2003). R^2 is coefficients of determination when one explanatory variable is regressed against all explanatory variables, using R^2, VIF is computed as

$$VIF_j = 1/(1-R^2)$$

Value of VIF greater than 10 often taken as signals for the existence of multicollinearity in the model (*Ibid*). Similarly, for dummy variables contingency coefficient (CC) was employed. The contingency coefficients (CC) were computed for the variables from chi-square (χ^2) value to detect the problem of multicollinearity (the degree of association between dummy variables). According to Healy (1984) cited in Mesfin (2005) the dummy variables are said to be collinear if the value of contingency coefficient is greater than 0.75. The contingency coefficient was computed as follow:

$$CC = \sqrt{\frac{\chi^2}{n+\chi^2}}$$

Where: C.C is contingency coefficient, n is total sample size,

χ^2 is chi-square values

RESULTS AND DISCUSSION

In this chapter the findings on the two objectives of the study are discussed in detail based on survey results.

Work motivation level of DAs

In order to reveal the level of work motivation of DAs, aspects which are DAs intensity, direction and persistence of efforts towards better performance to attaining organizational goals have been emphasized. Hence seven items were used to construct general work motivation aspects. Each items/questions had a five point Likert scale (Thurstone, 1976): 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree, 5=strongly agree. These items/questions were given weighted scores as per the responses/answers given by DAs and summed up, that gave score of the dependent variable.

The data obtained were used to categorize DAs into low, medium and high work motivation levels. The base for categorizing DAs is their deviations from the actual mean score distribution (that is, Actual mean ± Standard deviation =22.57±5.36) which was used by Addis (2007) and Yohannes (2009).Accordingly, those who score 13-17, 18-27 and above 28 were categorized into low, medium and high work motivation, respectively.

As indicated in Table 1, the obtained score of work motivation ranges from 13 to 35. The actual mean score of work motivation is 22.57 with the standard deviation 5.36 with minimum and maximum score of 13 and 35, respectiv-

Table2. The Maximum Likelihood Estimation of Ordered Logit Model for the Determinants of Work motivation of Development Agents.

Marginal effects Variables	Coefficient	Z	Low	Medium	High
Age	-0.1647	-1.41	0.0141	0.0675	-0.0736
Sex	1.1589	1.05	-0.0517	-0.0475	0.0992
Marital status	1.4400	1.44	-0.0123	-0.0590	0.0643
Back ground (rural/urban)	-0.4521	-0.35	0.0202	0.0185	-0.0387
work experience	0.0142	0.10	-0.0122	-0.0583	0.0636
Work location	-0.0902	-2.79**	0.0403	0.0370	-0.0773
Dependable supervisor	-0.4966	-0.96	0.0222	0.0203	-0.0425
Work incentive	3.5129	2.81**	-0.0157	-0.0144	0.0301
Perceived pay structure	0.4446	0.79	-0.0198	-0.0182	0.0381
Recognition	-0.4028	-0.88	0.0180	0.0165	-0.0345
Perceived job security	2.0157	2.40**	-0.0090	-0.0082	0.0173
Supervision	0.9146	1.78	-0.0408	-0.0375	0.0780
Perceived Type of performance appraisal	2.8436	3.03***	-0.0127	-0.0116	0.0243
Perceived policy environment	4.3827	3.52	-0.0196	-0.0179	0.0375
Promotion avenue	0.6587	0.96	-0.0294	-0.0270	0.0564
Attitude of DAs towards their job	5.2209	4.13	-0.0233	-0.0214	0.0447
Achievement motivation	0.8267	1.59	-0.0369	-0.0390	0.0708
Quality of work life	-0.8894	-1.32	0.0397	0.0364	-0.0761
Job description	3.7405	3.66	-0.0170	-0.0150	0.0320

Maximum likelihood estimates

Dependent variable	Work motivation of DAs
Log likelihood function	183.12
Predicted success	76.1 per cent
Chi-squared	90.23***

*** Significant at 1% level, ** Significant at 5%, and * Significant at 10% probabilit y level.
Source: Own computation from survey data, 2013

ely. The overall mean motivational- level score was 3.20 on a scale of 1 to 5 (1=lowest & 5=highest). Of the total, 21.8%, 58.1%, and 20.2% of DAs were low, medium and highly motivated respectively.

From the above result, it can be considered that work motivation of DAs in the study area is at medium level. Hence, majority of the DAs were identified as bellow the desirable level of work motivation and consequently are expected to contribute for the lower performances in their work (Marx, 2006). It is, therefore, interesting to discover that which factors are contributing to the current undesirable/poor level of work motivation of the DAs in the study area.

Results of Determinants of work motivation level of Das

Prior to running the logistic regression analysis, all the hypothesized explanatory variables were checked for the existence of multicollinearity problem Using Variance Inflation Factor (VIF) and contingency coefficients. Accordingly, there was no strong association among the variables. For this reason, all of the explanatory variables were included in the final analysis. All the explanatory variables were used to estimate the ordinal logistic regression model to determine the most significant variables affecting DAs work motivation. The ordered logit regression model was also fitted to estimate the effects of a unit change in the individual hypothesized explanatory variable towards the variance of work motivation level of DAs.

Thus, the results of the marginal changes in significant explanatory variables on work motivation level categories of DAs are presented in Table 2.

The study result revealed that work location is negatively influenced work motivation of DAs at 5% significant level. Its marginal effect shows that one unit (kilometer) increase in the work placement of DAs away from their home or family would result in a probability of decrease in higher work motivation level categories by about 7.7% whereas that

of low and medium work motivation level increases by about 4.0%,and 3.7% respectively. In line with this study, Yohannes (2009) Placement of DAs in all kebeles far or near regardless of the distance from their home or family obviously with inadequate transportation facilities could be one of the reasons causing work motivational problems among DAs.

As expected, job security is another important motivational factor, which has a positive impact on work motivation of DAs at 5% significance level. The estimated coefficient of the variable suggests that, being other variables kept constant, the probability of low work Motivation and medium work motivation categories reduces by about 0.09% and 0.08% respectively where as that of high work motivation level increases by about 1.7%.

Extension workers job satisfaction confirmed that a fully-trained extension worker must have job security. The implication is that unless they can see permanent and rewarding employment or possibilities of advancing to better job position in their organization they can't be expected to give a dedicated and efficient extension services.

The lack of adequate incentive system is the most observed and over-emphasized reason given by DAs for the low motivation in their work. The model result revealed that availability of appropriate incentive systems in extension organizations has a positive impact on work motivation of DAs at 5% level of significant. The marginal effect on the availability of appropriate incentive system implies that, other things being constant, an increase of a unit of work incentive, the probability of work motivation of low and medium category decreases by 1.57% and 1.44% respectively whereas, the probability of work motivation for high work motivation category increases by about 3.01%.

Availability of effective supervision mechanisms in extension organizations was also found an important tool to improve DAs work motivation and strengthen their performance. Supervision system was found to influence work motivation positively and significantly at 10% level. As the implementation of effective supervision systems in extension organizations increases, the probability of the work motivation of low and medium category decreases by 4.08 % and 3.7% respectively, while the probability of work motivation for high category increases by 7.8%.

Regarding to the availability of job description and relevancy of duties and responsibilities given to DAs in the study area, the model result revealed that it was found to have a positive impact on work motivation of DAs at 1% level of significance. The impact of a unit increase in a relevant duties and responsibilities in extension organizations for DAs of the study woredas, the probability of the work motivation for high category increases by 3.2 %, where as the probability of work motivation of low and medium category decreases by 1.70% and 1.50% respectively. The result also showed that favorable performance evaluation has positive and significant impact on DAs work motivation at 5% level. The marginal effect shows that, on the availability of favorable performance appraisal implies that, other things being constant, an increase of a unit of favorable performance appraisal in extension organizations the probability of work motivation for high work motivation category increases by about 2.43%, where as the work motivation of low and medium category decreases by 1.27% and 1.16% respectively.

Policy environment of Extension organization in the study area was found to have positive and significant impact on work motivation of DAs at 1% level. The marginal effect on the Availability of favorable and clearly defined policies in extension organizations implies, other things being constant, an increase of a unit of favorable policy environment the probability of work motivation for high work motivation category increases by about 3.75% where as the work motivation of low and medium category decreases by 1.96% and 1.79% respectively. With regard to organizational policy there appears to be general dissatisfaction among DAs in the way that the Districts offices are managed. About 72 % of the DAs were not happy with the administrative style of their organization.

Development agents overall work motivation was found to be influenced positively and significantly by their attitudes toward their job at 1% level. The marginal effect shows that, as the dissatisfies in extension organizations in the study area decreases the probability of work motivation for high work motivation category increases by 4.47 % while the work motivation of low and medium category decreases by 2.33% and 2.14% respectively.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Results of analysis of ordered logit model shows that, the most important independent variables that accounted for the explained variance of work motivational level of DAs were work location, work incentives, job security, job description, supervision systems, performance appraisals, policy environment of extension organizations, and attitude of DAs towards their job. The study result revealed that work location is negatively influenced work motivation of DAs at 5% significant level. Job security is another important motivational factor, which has a positive impact on work motivation of DAs at 5% significance level. The result also revealed that availability of appropriate incentive systems in extension organizations has a positive impact on work motivation of DA. Job description and relevancy given to DAs was found to have a positive impact on work motivation of DAs at 1% level of significance. The result also showed that favorable performance evaluation has positive and significant impact on DAs work motivation. Furthermore, Policy environment of Extension organization in the study area was found to have positive and significant impact on work motivation of DAs at 1% level.

Moreover, Development agents overall work motivation was found to be influenced positively and significantly by their attitudes toward their job at 1% level.

RECOMMENDATION

Therefore, Efforts have to be made to improve work related problems (like role ambiguity, non professional activities and

work overload) in extension organization of the study area. Thus, the success of an extension organization is reliant on the implementation of favorable policy to optimize their human resources. It is recommended that occasional training program may be arranged for higher and middle level managers of the study organization to make them clear about the favorable environment and opportunities to be capitalized, which, in turn, will percolate down to the grassroots level. Understanding of what is expected of individuals and DAs as a team in the extension organizations would help DAs put considerable effort in achieving the desired goal.

Administrators should conduct performance evaluations on a continuous, accurate and objective manner and the results should not only be used for administrative purposes instead it should essentially be used to enhance DAs work motivation and thereby improve performances.Thus, reward system of extension organizations in the study area must also be internally equitable and adequate to DAs.

Extension organizations should have mechanisms to encourage DAs mainly through developing job security schemes and provision of further education for DAs in B.Sc. level in their professional subjects. due attention should be given to the strengthening of transportation facilities, as suggested earlier and placement of adequate number of DAs in all kebeles of the study areas and this would lessen work stress of DAs. Moreover, the possibility of providing loans with meager interest rate and longer duration for repayment to purchase motor bikes by themselves could also be helpful.

DAs should get relevant, adequate and regular supervision from extension organizations. Supervisors are also required to be fair and accessible to DAs. It is important to involve DAs in the designing of motivational systems. It is, at the same time, a starting point for a participatory approach in designing better human management policies in agricultural extension organizations of the study area and elsewhere in this country.

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