

*Full Length Research Paper*

# **Effectiveness of development agents' performances in agricultural technology dissemination: The case of Southern Nations Nationalities and Peoples Regional State (SNNPRS), Ethiopia**

**Kinfe Asayehegn\*, Gebrehiwot Weldegebrial and Deribe Kaske**

School of Environment, Gender and Development Studies, Awassa College of Agriculture, Hawassa University, Ethiopia.

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Although the Government of Ethiopia has developed a grand Five-Year Growth and Transformation Plan (FYGTP) for economic development, aspiring to achieve a middle income country status by the year 2025 through a transformation of the economy of the agriculture led industry, the shift of focus in the role of development from agriculture to industrialization has not altered the objective of enhancing agricultural production and productivity. To this end, the agricultural extension service which is determined by its institutional effectiveness and competency of the development agents (DAs) at field has pivotal role to derive the transformation process. This study was based on data collected from 108 DAs in SNNPR from 12 Woredas using structured questionnaire. Results indicated that manmade and natural factors are affecting the DAs effectiveness on their job performance. The challenges were found to have three categories, namely DAs capacity based challenges, farmer based constraints and infrastructure/ service based constraints. On the job training that would build the knowledge, skill and commitment level of the expertise and improve the working environment of DAs including availability of logistics, incentives in kind and promotion is recommended.

**Key words:** Development agent, effectiveness, performance, technology dissemination.

## **INTRODUCTION**

Improving the living standard of the households and ensuring food security at the household and national levels require the invention and transfer of agricultural technologies, which addresses the technological needs of all agro-ecological zones, improves farmers' access to inputs and credits and improves the performance of the market and distribution systems. Consequently, a recent policy document of the Government of Ethiopia, particularly on the Agriculture Sector Policy and Investment Plan shows that Ethiopia is aspiring to achieve a middle income country status by 2025. As a result, the

Government of Ethiopia has recently sketched a grand five-year strategy (2010/11 to 2015/16) for economic development, Five-Year Growth and Transformation Plan (FYGTP), and in line with it, the Agricultural Growth Program (Agriculture Sector Policy and Investment Plan 2010-2020). The FYGTP recognizes the pivotal role of agriculture, and it aims to double the national economy by doubling agricultural output and to sustainably increase rural incomes and national food security. The specific objectives of agriculture and rural development component of the FYGTP encompass: (i) achieving a sustainable increase in agricultural productivity and production; (ii) accelerating agricultural commercialization and agro-industrial development; (iii) reducing degradation and improving productivity of natural resources; and (iv) achieving universal food security and

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\*Corresponding author. E-mail: [kinfe85@gmail.com](mailto:kinfe85@gmail.com). Tel: +251 913 41 30 63.

protecting vulnerable households from natural disasters (MoARD, 2010).

Although Ethiopia is currently in a transition from an agriculture led development to an industry led development, the shift of focus in the role of development from agriculture to industrialization has not altered the objective of enhancing agricultural productivity with the new system of agricultural extension that was part of the Agricultural Development Led Industrialization (ADLI). The agricultural extension system to satisfy such a strategy is termed as Participatory Demonstration and Training Extension System (PADETES)". In contrast to the past extension systems where the focus was limited either to technology transfer or human resource development, PADETES gives equal emphasis to human resource development (organization, mobilization, and empowerment) along with its effort to promote appropriate technologies. The mission of extension is to extend education from research and technology centers to people. The emphasis is on helping people to help themselves (Gonzalez, 1982; Patton, 1987; Sanders and Mauder, 1966; Whitemore, 1998; Csaki, 1999; Maguire, 2002). To keep pace with these rapid developments, the delivery of quality extension education programs is dependent upon two elements: (a) an adequate amount of appropriate information and technology; and (b) sound teaching approaches to bring about the desired change (Zainuddin and Teh, 1982). However, this depends on the effectiveness and competency of the development agents (DAs). The major role of extension professionals is to diffuse information and transfer of technologies using appropriate teaching strategies, procedures, and techniques (Maatoug, 1981; White, 1994; Boyaci, 2006).

The effectiveness of the extension programs depends on the abilities and skills of its workers. Okley and Garforth (1985) concluded that the whole extension process is dependent upon the extension agent, who is the critical element in all extension activities. The effectiveness of extension agent can often determine the success or failure an extension program. Maunder (1972) pointed out that economic and social growth among people in any nation depends on the ability to build on a dignified staff of properly trained, professional people to manage the development enterprise. Swanson (1976) stressed that all men and women who work with the extension service whether as specialists, administrators, supervisors or field-level workers should have basic skills in and understanding topics such as: extension service organization and operation, including its overall purpose, mission, policies and procedures, human resource development including the participatory processes of involving people in program planning and development, staff-client relationships, and personnel management, program development process, from problem identification and needs assessment to program design, implementation and appraisal, communication strategies not only for program delivery but also for groups and

feeding this information to research and other appropriate agencies and groups, and evaluation techniques for the purpose of determining the effectiveness and value of extension programs to users.

Medeiros (2005), in his study concludes that incumbent tenure and size of the technical services unit affect both perceived and expected competencies, with the latter having a greater effect. He furthermore emphasized that professional background not only affects competency possession, but has only a marginal effect on competency expectation. Heffernan and Flood (2000), Dhanakumars (2001), Linders (2001), Armstrong (2006) and Ali Hassan et al. (2008) also concluded that job performance is related to competencies. These competencies remain one of the important variables to use in order to explain the performance of agriculture extension worker as leader to farmers. Consequently, competencies could potentially be used to integrate and link an organization's main human resource process such as extension performance management, training and leadership development, succession planning and rewards to the agriculture extension and rural development strategy. Ali et al. (2009) described four areas, knowledge, attitude, skills and attributes, to develop competency among the agricultural extension organizations and level of involvement is one of the main contributors to competency.

In developing countries like Ethiopia, most extension personnel are working under difficult and disadvantageous conditions. Fieldwork in many developing countries is characterized by conditions that foster low morale: lack of mobility, virtually no equipment and extremely low salaries. For many extension workers, tapping additional income sources is a question of physical survival (Nagel, 1997). These difficulties contribute to a high turnover rate; those who remain in extension are typically people with few employment opportunities elsewhere (Kaimowitz, 1991). Farmers show lack of confidence in extension workers (Opio-Odongo, 2000). This is partly because agents are often instructed to transmit recommendations from research stations, which are formulated with little regard for smallholders or for the specifics of the extension agents' areas. As one of the few government institutions with the broad coverage of the rural areas, extension agents are liable to be engaged in performing any task which fulfils ministerial policy at village level, be it supplying inputs and credit, transferring technology, feeding back information to research workers, mobilizing local communities for group action to solve community-wide problems, or dealing with specific farmer problems and referring them to specialists. Because policy objectives tend to outstrip the resources available to achieve them, this leads to overload on the agents. Moreover, it also leads to their trying to do jobs for which they have neither the training nor the experience. The resultant pressure of being expected to do more than they are able both

quantitatively and qualitatively demoralizes the extension staff (Wiggins, 1986).

## METHODOLOGY OF THE STUDY

### Description of the study area

This study was conducted during the year 2011, in 12 selected Woredas and 36 Kebeles of the Southern Nations, Nationalities and Peoples' Regional State (SNNPR) of Ethiopia. SNNPR occupy most of south-western part of Ethiopia, with a total land area of about 112,000 square kilometers, some 10% of the area of the country (Figure 1). The region contains up to one-fifth of the country's population, with 15 millions according the last census CSA, 2007). SNNPR is the region of the country with by far the greatest number of ethnic and language groups, diversified agro-ecological Zones including: arable highlands (*dega*), midlands (*woina dega*) and lowlands (*kolla*), and pastoral rangelands (*bereha*). But the most characteristic environment of the region is fertile and humid midland, which contains the densest rural populations of Ethiopia.

The multi-stage sampling procedure was followed to select administrative zones based on their agro-ecology and at last the sample DAs. First, the region was categorized into four major zones and secondly, to ensure probability of selection of a sample to be equal for each stratum, Woredas were selected randomly proportional to their size from the four strata. Finally, a total number of 108 DAs were selected after selecting three Kebeles from each Woreda.

### Data collection and analysis

Both primary and secondary data were collected and used, which was qualitative and quantitative in nature. The primary data was gathered from 108 DAs using structured questionnaire and interview schedule, respectively. And informal discussion with key informants such as head of Woreda agricultural office, extension experts, and Kebele's chairman was conducted. On the other hand, the secondary data was obtained from secondary sources such as documents of the study, regional, zonal and Woreda agricultural offices of the region. The data collected from document reviews, key informants using informal discussion, sample development agents through questionnaire interview was analyzed using different techniques. In analyzing the quantitative categorical type of data, descriptive statistics such as percentage, cross tabulation and chi-square test was used. And while in analyzing the quantitative continuous types of variables mean, standard deviation and t-test was used. Alternatively, narrative type of analysis was used to analyzing qualitative type of data and to enrich and illustrate a qualitative conclusion.

## RESULTS AND DISCUSSION

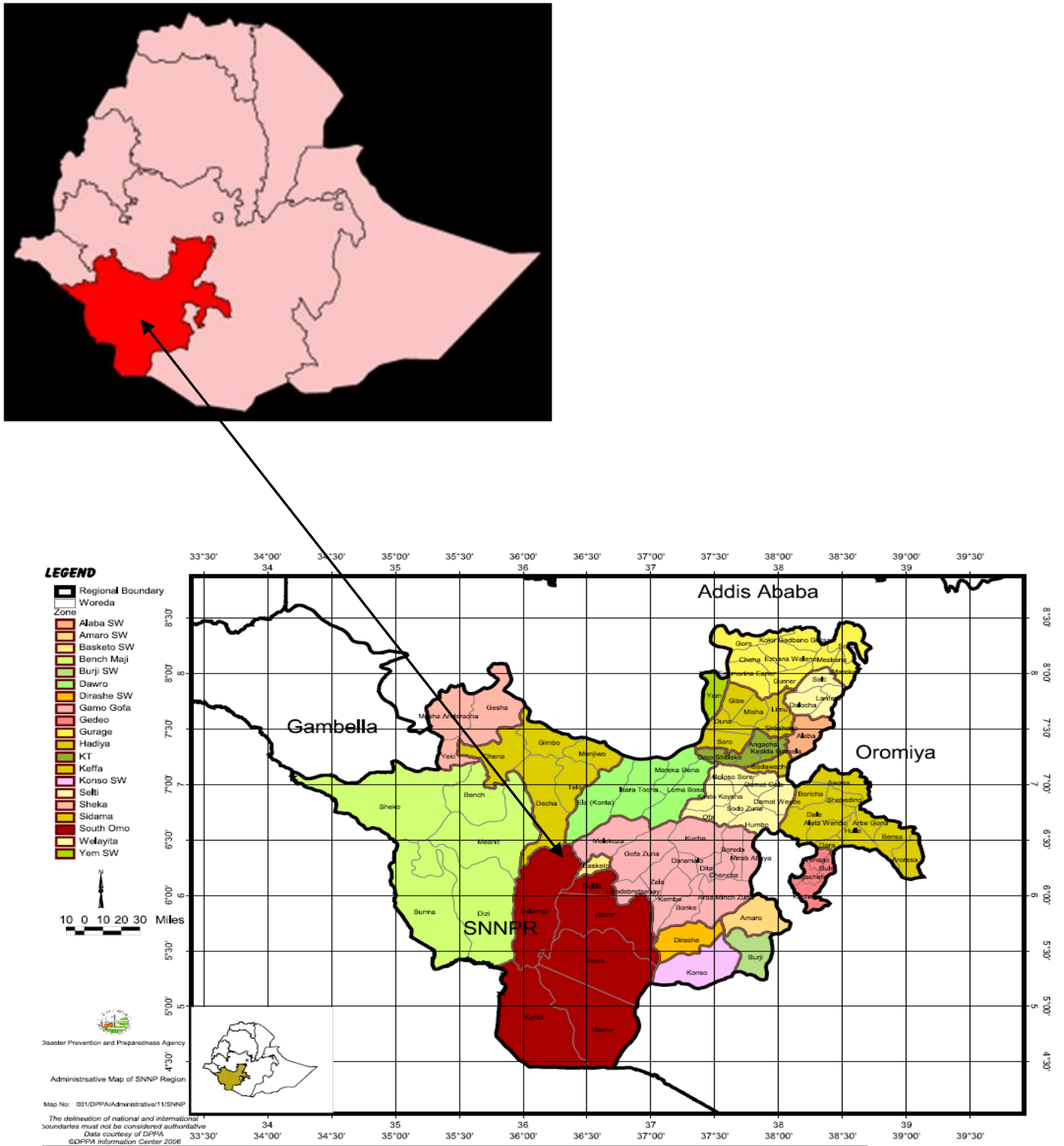
### Socio-economic characteristics of development agents

In the context of the study area, keeping in mind the greater gender disparity, of the total sample development agents, 66.7 and 33.3% of them were male and female, respectively (Table 1). This briefly shows that the ratio between male to female development agents who are currently serving the community is twice. As a result, in countries like Ethiopia having greater gender disparity

with few female extension workers, it is very challenging to give agricultural extension service equally both to the female and male household heads at the same time. In connection to the marital status of the sample respondents, out of the total, 62 and 38% of them were single and married, respectively (Table 1). There was no divorced or widowed sample respondent at the time of the survey. It is also understood that those development agents who got married are more stable to work in their residence closely with the community by creating strong social integrity, and as a result, no more staff turnover, minimize extension project and program interruptions. Developing a deep understanding of farmers' problem could help in proposing the possible coping mechanisms and opportunities to improve the livelihood of the farmer. Another very important factor in extension work is the agents' background in farming. Accordingly, 67.6 and 32.4% of the respondents had rural and urban backgrounds, respectively (Table 1). Since the majority of the respondents have a rural background, it is believed that they have good experience about the general characteristics of rural livelihood. Smallholder farming system, can easily understand farmers' problem, identify and manage constraints in technology dissemination rather than these having urban background.

Regarding to the educational background of the sample respondents, 97.2% are a two-year or more years certificate holders and the rest 2.8% are Bachelor of Science graduates in agriculture. The survey result depicted that of the total respondents 32.5, 31.5 and 4.6% of the development agents' profession are crop extension, equally both to livestock extension, and Natural resource management and forestry extension and general agriculture, respectively (Table 2). The result of the survey also indicates there is equal weight given to livestock extension, crop extension, and natural resource management and forestry extension departments. However, little attention is given to extension communication experts. The reason behind this was because all ATVETS in the nation train experts by giving their focus on livestock, crop and natural resource management and forestry extension at diploma level.

In addition, the sample survey results revealed that all the sample respondents have normal physical condition; no one has physical disability (Table 1). The assumption here is in areas where infrastructural facilities like road, vehicle or motor cycle, telephone, etc are absent, development agents are expected to travel on-foot to the areas where farmers live to assist the required agricultural extension service at the time of need to the target farmers. In line with this, development agents were also asked to give their response to the agro-ecological zone of their work area. Accordingly, 36.1, 61.1 and 2.8% of the sample respondents are working under low-land, mid-land and high-land agro-ecological zones, respectively. The nature of the varied ecological diversities and the fact that within the same agro-ecology farmers differ in terms of resource endowments, constraints, opportunities



**Figure 1.** Administrative map of Southern Nations Nationalities and Peoples Region, Ethiopia. Source: Wikipedia, developed by Golbez freely to share, remix and adapt.

and managerial abilities, call for the development and promotion of appropriate packages that are suitable to

the diverse agro-ecology and heterogeneous preferences of the farmers in the country (Belay and Abebaw, 2004).

**Table 1.** General characteristics of sample das by geographical distribution.

| General information | Variable                   | Major zones, N = 108 |         |         |          | Total N (%) |
|---------------------|----------------------------|----------------------|---------|---------|----------|-------------|
|                     |                            | Western              | Central | Eastern | Southern |             |
| Sex                 | Male                       | 5                    | 33      | 19      | 15       | 72 (66.7)   |
|                     | Female                     | 13                   | 3       | 8       | 12       | 36 (33.3)   |
| Marital status      | Single                     | 10                   | 18      | 19      | 20       | 67 (62)     |
|                     | Married                    | 8                    | 18      | 8       | 7        | 41 (38)     |
| Physical condition  | Normal                     | 18                   | 36      | 27      | 27       | 108 (100)   |
|                     | Disabled                   | 0                    | 0       | 0       | 0        | 0           |
| Agro-ecology        | Lowland                    | 5                    | 14      | 2       | 18       | 39 (36.1)   |
|                     | Midland                    | 13                   | 22      | 25      | 6        | 66 (61.1)   |
|                     | Highland                   | 0                    | 0       | 0       | 3        | 3 (2.8)     |
| Background          | Rural                      | 10                   | 32      | 14      | 17       | 73 (67.6)   |
|                     | Urban                      | 8                    | 4       | 13      | 10       | 35 (32.4)   |
| Education           | BSc /BA                    | 0                    | 2       | 1       | 0        | 3 (2.8)     |
|                     | 2 year or more certificate | 18                   | 34      | 26      | 27       | 105 (97.2)  |

**Table 2.** Distribution of development agents by appropriate profession.

| Profession of DAs          | Response of sample respondents, N = 108 |         |
|----------------------------|---|---------|
|                            | Frequency                               | Percent |
| General agriculture        | 5                                       | 4.6     |
| Livestock extension        | 34                                      | 31.5    |
| Crop extension             | 35                                      | 32.4    |
| NRM and Forestry extension | 34                                      | 31.5    |
| Total                      | 108                                     | 100     |

**Table 3.** Mean distribution of respondents by age, household size and work experience.

| Independent variable  | Response of sample respondents, N = 108 |      |       |                | t-Value  |
|-----------------------|---|------|-------|----------------|----------|
|                       | Min.                                    | Max. | Mean  | Std. deviation |          |
| Age                   | 21                                      | 56   | 30.50 | 7.216          | 5.583    |
| Household size of DAs | 1                                       | 9    | 2.97  | 2.133          | 2.023*** |
| Work experience       | 0                                       | 33   | 7.88  | 6.228          | 6.662*** |

\*\*\*, Significant at less than 1% probability level.

It is also noteworthy that the promotion of uniform packages of technologies/practices to heterogeneous groups of farmers will tend to marginalize resource poor farmers who lack financial resources to pay, have enough and appropriate land for cultivation for the newly introduced technologies and associated inputs.

The mean age of the sample respondents was 30.50, with a minimum of 21 and maximum of 56 years (Table 3). This indicates that all of the sample respondents are

between the ranges of the productive labor. In line with this, the survey result also depicted that the mean household size and work experience of sample development agents was 2.97 and 7.88 years, respectively (Table 3). Though, the length of sample respondents work experience varies from person to person, the range of their work experience is between the minimum of 0 and maximum of 33. Accordingly, the work experience of DAs has a vital role in technology dissemination since

**Table 4.** Distribution of respondents by annual income sources.

| DA's annual income sources | Response of sample respondents, N = 108 |            |            |                | t- value |
|----------------------------|---|------------|------------|----------------|----------|
|                            | Min. (ETB)                              | Max. (ETB) | Mean (ETB) | Std. deviation |          |
| Annual salary              | 13404                                   | 33804      | 19008.24   | 379.855        | 43.33*** |
| Livestock production       | 0                                       | 5,000      | 81.02      | 528.210        | 1.594*   |
| Crop production            | 0                                       | 15,000     | 166.67     | 1469.312       | 1.179*   |
| Poultry                    | 0                                       | 3,000      | 32.41      | 292.213        | 1.153*   |
| Local canteen              | 0                                       | 0          | 0          | 0.00           | .000     |
| Remittance                 | 0                                       | 0          | 0          | 0.00           | .000     |
| Total annual income        | 13,404.00                               | 56,804.00  | 19,288.34  |                |          |

\*, \*\*, \*\*\*, Significant at less than 10, 5 and 1% probability level, Source: Field survey, 2011. The annual salary of DAs is written as the gross salary without deducting government tax.

they are better in understanding the real farmers' problem, the real situation of the area, can communicate easily with the farmer, work closely with local leaders and elders, and can develop collaborative work with their colleagues and supervisors.

Moreover, the response of the sample respondents indicated that of the total sample development agents, the majority 96.3% have no another source of income and the rest few 3.7% gain income from livestock production, crop production and poultry beside their mean annual income salary (19,008.00 Ethiopian birr). However, sample development agents did not have any other source of income like income from local canteen house and remittance. In connection to this, the total mean annual income of the sample development agents is 19,288.34 ETB with 13,404.00 ETB minimum and 56,804.00 ETB maximum annual incomes per development agent. When the mean annual income of the sample development agents is divided by their mean household size (Table 4), it becomes 6336.00 ETB, and this is without taxation of their salary. With this difficult situation and high cost of living, it is a challenge for development agents to serve the community effectively and efficiently since they need another income to fulfill their social and economical unrest needs. Because of this and other factors, performance of development agents in technology dissemination is not as intended.

### Major mandates and constraints of development agents in technology dissemination

In Ethiopia, extension service is one among the few government institutions with the assignment to play a pivot role in changing the livelihood of smallholder farmers with broad coverage of the rural areas through development agents. In this case, development agents are liable to be engaged in performing any task which fulfils ministerial policy at village level that given by their hosting organization following the national extension

system of the nation – that is PADETES. Consequently, the extension workers have their own regular jobs as presented in the job description. Some of the DAs pursue the job properly and use their time to the profession while others have either additional workloads or give better emphasis to activities different to the job description. This has two dimensions: the DAs interest to work either for additional income or mental satisfaction in one hand and due to boss assignments to different positions and activities on the other hand. Accordingly, majority of the sample development agents' regular engagement works included transferring technology to target farmers, mobilizing local community for group action to solve community wide problems, supplying inputs and give training to farmers (Table 5). Beside this, development agents also engage in identifying specific farmers' problems and referring them to subject matter specialists, facilitating credit and credit repayment issues, work as transformer between governmental organizations (GOs), NGOs, research and other private sectors for the improvement of farmers' livelihood, collecting government tax and some few run their own private business. This briefly indicates development agents were overloaded to undertake these and other policy objectives of the government. Moreover, it also led to their trying to do jobs for which they have neither the training nor the experience and the resultant pressure of being expected to do more than they are able demoralizes and affects the performance of development agents in technology dissemination.

As shown in Table 6, the DAs of the study region have different tasks for serving the farm families of the rural people. Transformation of technologies to farmers and farmers' advice shares greater portion among the others. The advice comprises two forms, theoretical explanation and practical training. Demonstration is one of the practical teachings of farm families. Hence, a total of 90.7 and 86.1% of the DAs practice method and result demonstrations on farm plots and Farmers Training Centers (FTCs) of recommended technologies. However, based on the information of the DAs and farm families, the frequency and type of training using method and

<sup>1</sup> ETB- Ethiopian Birr, 1ETB= 17.12USD as of October 2011.

**Table 5.** Distribution of sample DAs by regular engagement given by the hosting organization, and major zones.

| Mandates of DAs   | Percentage of sample respondents, N = 108 |         |         |          | Total |
|---|---|---------|---------|----------|-------|
|   | Western                                   | Central | Eastern | Southern |       |
| Supplying inputs  | 55.5                                      | 94.4    | 77.8    | 70.37    | 77.78 |
| Facilitating credit and credit repayment issues             | 55.5                                      | 86.1    | 48.15   | 55.56    | 63.89 |
| Transferring technology to target farmers                   | 94.4                                      | 100     | 88.9    | 100      | 96.23 |
| Linking GOs, NGOs, Research and other private sectors       | 33.3                                      | 75      | 22.22   | 77.8     | 55.56 |
| Community mobilization                                      | 72.22                                     | 86.1    | 70.37   | 92.59    | 81.48 |
| Dealing with specific farmers' problem and referring to SMS | 50  | 75      | 59.26   | 70.37    | 65.74 |
| Give training for the farmers                               | 61.1                                      | 66.66   | 81.48   | 92.59    | 72.93 |
| Collecting government tax                                   | 0   | 16.66   | 3.7     | 29.63    | 13.89 |
| Running their own private business                          | 1.7                                       | 2.00    | 0.00    | 0.00     | 0.93  |

**Table 6.** Percentage distribution of DAs in demonstration per year.

| Frequency per year    | Percentage of DAs participation in demonstration |                      |
|-----------------------|--|----------------------|
|                       | Method demonstration                             | Result demonstration |
| Once                  | 23.1   | 38                   |
| Twice                 | 40.7   | 25.9                 |
| Three times and above | 26.9   | 22.2                 |
| total                 | 90.7   | 86.1                 |

result demonstration is below the requirement. Most of them use formal, large group size and homogenous meetings rather than combined approaches. Moreover, different farmers of the study area need different types of trainings based on their activity and livelihood option difference. DAs need to analyze the type, frequency and intensity of farmers need on different trainings. To this end, due to different factors some of the DAs conduct farmers training needs assessment while others do not yet. A total of 59.23% of the DAs conduct farmers training needs assessments and 90.62% of those who practice farmers needs assessment conduct farmers training based on the result of their own training needs assessment. However, a total of 54.63% of the DAs conduct farmers training on farmers' site and Farmers Training Centers (FTCs) regardless of the results of training needs assessment.

The results of the study explored DAs of the area to be on their regular duty, requires different services and facilities. It was observed that manmade and natural factors are affecting the DAs motivation on their job performance. The challenges were found to be of three categories, namely DAs capacity based challenges, farmer based constraints and infrastructure/service based constraints. With regard to service/infrastructure facilities, it was found that a total 92% of the respondents worked under different difficulties, disadvantageous and unfavorable conditions. Hence, Table 7 shows that 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. However, the response of 63.0, 61.1, 60.2, 57.40 and 53.7% of the total sample development agents were working under areas characterized by lack of infrastructural facilities such as transportation problem, residence house problem, remoteness, extremely low salary and lack of incentives respectively. In connection to this, 53.7, 52.8, 38.9 and 26.9% of them also works in areas characterized by lack of mobility freedom, virtually no equipment /materials both at the field and office, health and life insurance problems and unfavorable condition of the area to their health. These conditions hinder extension professionals not to perform their mandate as expected in their day to day working areas.

According to the perception of sample development agents provided in Table 8, shortage of working capital (e.g. credit), lack of transport and communication facilities in the vicinity, inflation in price and timely unavailability of inputs (e.g. fertilizer), lack of farm tools and inputs for better production, seasonal infestation of pests and disease and poor rural infrastructure e.g. road, telecommunication etc., are determinant problems directly affecting farmers technology adoption and indirectly threatening the effectiveness of development agents' performance in technology dissemination. In addition to the aforementioned problems, absence of farmers training centers in some Kebeles and their malfunctionality in other Kebeles were also among the problems that made them to develop resistance to adopt new technologies and discouraged the development agents' towards their profession. The farmers also

**Table 7.** Percentage Distribution of sample respondents by the characteristics of working environment, and major zones.

| Condition of DAs working environment | Percentage of sample respondents, N = 108 |         |         |          |       |
|--------------------------------------|---|---------|---------|----------|-------|
|                                      | Western                                   | Central | Eastern | Southern | Total |
| Lack of mobility freedom             | 33.33                                     | 61.11   | 40.74   | 66.67    | 52.8  |
| Virtually no equipment /material     | 0.00                                      | 44.44   | 33.33   | 62.96    | 38.9  |
| Extremely low salary                 | 76.47                                     | 63.89   | 33.33   | 62.96    | 57.40 |
| Transportation problem               | 50.00                                     | 75.00   | 44.44   | 74.04    | 63.00 |
| Housing problem                      | 55.56                                     | 77.78   | 44.44   | 59.26    | 61.16 |
| Lack of incentives                   | 72.22                                     | 58.33   | 37.04   | 51.85    | 53.7  |
| Remoteness                           | 50.00                                     | 69.44   | 48.15   | 51.85    | 60.2  |
| Unfavorable condition                | 5.56                                      | 50.00   | 29.63   | 7.40     | 26.9  |
| Health and life insurance problems   | 16.67                                     | 61.11   | 29.63   | 33.33    | 38.9  |

**Table 8.** Principal constraints to the promotion and adoption of new technologies as perceived by the DAS<sup>1</sup>.

| Constraints  | Percentage of sample respondents, N = 108 |         |         |          | Total | $\chi^2$  |
|--|---|---------|---------|----------|-------|-----------|
|  | Western                                   | Central | Eastern | Southern |       |           |
| Shortage of working capital  | 9.26                                      | 31.48   | 24.07   | 16.67    | 81.48 | 19.882*** |
| Pests and diseases   | 9.26                                      | 0.20    | 12.04   | 14.82    | 56.48 | 1.168     |
| Unavailability of farm implements  | 4.63                                      | 17.59   | 14.82   | 15.74    | 52.78 | 6.093*    |
| High price of inputs ((e.g. fertilizer)  | 15.74                                     | 31.48   | 25.0    | 23.15    | 95.37 | 1.887*    |
| Timely unavailability of inputs  | 3.70                                      | 22.22   | 18.52   | 19.44    | 63.89 | 17.137*** |
| Transportation problem   | 5.56                                      | 23.15   | 10.19   | 15.74    | 54.63 | 9.339**   |
| Resistance of farmers to adopt new technology  | 14.82                                     | 16.67   | 11.11   | 22.22    | 64.81 | 19.814*** |
| shortage of time to teach all farmers  | 12.96                                     | 26.85   | 14.82   | 18.52    | 70.37 | 8.837**   |
| Lack of effective follow-up by DAs   | 8.33                                      | 16.67   | 9.26    | 15.74    | 50.00 | 3.630*    |
| DAs lack practical skills  | 1.85                                      | 6.48    | 3.7     | 6.48     | 18.52 | 1.902*    |
| Some of the new agricultural technologies are not suitable with farmers real problem | 1.85                                      | 13.89   | 7.4     | 14.82    | 37.96 | 11.716*** |
| No farmer training centre nearby   | 10.19                                     | 6.48    | 0.93    | 17.59    | 35.19 | 35.608*** |
| Other undefined constraints  | 0.93                                      | 0       | 0       | 0        | .93   | 7.391     |

\*, \*\*, \*\*\*, Significance at less than 1, 5 and 10% probability level respectively. <sup>1</sup>The percentage under each major zone considers as a portion from the total respondents. This result was also used by Belay and Adnew (2004).

believed that lack of effective continuous follow up by DAs themselves, Woreda supervisors and lack of practical skills by DAs play their own role in hindering technology dissemination. In addition to these constraints, high illiteracy level of farm families, low income of the households, and lack of cooperation among farmers to tackle their own problems also played a tremendous effect on the success of agricultural extension services.

Moreover, the survey result in Table 9 depicted that development agents can necessarily perform their functions effectively to the community they serve if they receive adequate logistical support, if there is availability of agricultural inputs at the needed time and having fair price, and there are in-service and job trainings to narrow the gap between the actual and required skill and knowledge they possess and other technical assistance from their supervisors and other concerned institutions.

With regard to the third dimension as depicted in Table 9, field level extension workers of the region also face different capability/capacity related difficulties/gaps on their regular activities. Difficulties in defining the priority goals and objectives, determining the options of implementation, identifying the resource needed for implementation, identifying the right person responsible for the right specific activities, planning the schedule of activities, determining the outcome each activities, deciding how to measure activities, summarizing the final work plan, and reporting of the activities are the major problems of DAs related to their capacity.

## CONCLUSION AND RECOMMENDATION

This study revealed that the development agents of the



**Table 9.** Percentage<sup>1</sup> distribution of the DAs' difficult in extension program planning, by major zones.

| DA's difficult in extension planning                   | Percentage of sample respondents, N = 108 |         |         |          |       |
|--|---|---------|---------|----------|-------|
|  | Western                                   | Central | Eastern | Southern | Total |
| Defining the priority goals and objectives             | 77.78                                     | 38.89   | 0       | 59.25    | 40.74 |
| Determining the options of implementation              | 83.3                                      | 25.00   | 3.7     | 55.56    | 37.03 |
| Identifying the resource needed                        | 77.78                                     | 38.89   | 0       | 74.07    | 53.7  |
| Determining who is responsible for specific activities | 77.78                                     | 41.66   | 0       | 55.56    | 40.74 |
| Planning the schedule of activities                    | 88.89                                     | 25.00   | 3.7     | 55.56    | 37.96 |
| Determining the outcomes of each activity              | 77.78                                     | 30.56   | 0       | 59.25    | 37.03 |
| Deciding how to measure achievements                   | 83.3                                      | 44.44   | 0       | 55.56    | 42.59 |
| Summarizing the final work plan                        | 94.44                                     | 27.78   | 3.7     | 51.85    | 38.89 |
| Reporting the activities                               | 88.89                                     | 30.56   | 0       | 51.85    | 37.96 |

<sup>1</sup>The percentage under the major zones does not include the total respondent, rather than individuals in the major zones.

studied region face different capacity related difficulties while accomplishing their regular activities, such as difficulties in defining the priority goals and objectives, determining the options of implementation, identifying the resource needed for implementation, and so on. Moreover, DAs have limitations of appropriate extension method selection and utilization. To this end, majority of the DAs use farm and home visit although they have different alternatives and it is in contrary with the insufficient number of development agents serving the community in the study area in particular and the country in general. In light of these results, it is essential for both GOs and NGOs to carry out job-training for development agents so as to build their capacity in terms of knowledge, skill and level of commitment as extension experts; and in this way able to use and manage effectively combined extension methods and communication media. The results of the study depicted that DAs are the key source of appropriate agricultural information to farmers since they are working closely with farmers beside to their profession than other stakeholders in agriculture. However, development agents are found working under areas characterized by lack of infrastructural facilities such as transportation problem, residence problem, remoteness, extremely low salary and lack of incentives. In connection to this, many of them also work in areas characterized by lack of mobility freedom and virtually no equipment/materials both at the field and office. These conditions hinder extension professionals in performing their mandate as expected in their day to day working areas. Accordingly, there is a need to improve the working environment of DAs, including availability of logistics, incentives in kind and promotion. Therefore, the government, NGOs, and community-based organizations (CBOs) need to give top priority to the development of rural infrastructure facilities such as rural road construction, telecommunication and transportation networks to make DAs accessible to farmers and farmers to market services, able to reduce marketing costs of inputs, save labor and time, and to improve their style of living

condition.

According to the results of this study, the development agents' regular engagements works given by their hosting organization included transferring technology to target farmers, mobilizing local community for group action to solve community wide problems, supplying inputs and giving training to farmers. Beside this, development agents were also engaged in identifying specific farmers' problem and referring them to subject matter specialists, facilitating credit and credit repayment issues, work as transformer between GOs, NGOs, research and other private sectors for the improvement of farmers' livelihood, collecting government tax. This briefly indicated that development agents were overloaded to undertake this and other policy objectives of the government having weak and informal coordination among research, extension and farmer; and existence of insufficient development agents to serve all farmers in the study area. Moreover, it also led to their doing jobs for which they have neither the training nor the experience and this in turn affected the performance of development agents in technology dissemination. Therefore, the Regional Bureau of Agriculture has to minimize overload of extension agents from non-extension tasks such as distribution of credit, credit repayment and tax collection. It is also pertinent to train and recruit additional qualified female DAs in mind of the geographical coverage, gender disparity and numbers of farmers needing agricultural extension services. Moreover, it is also crucial to have these trainings for activities not yet experienced.

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