

IMPACTS AND IMPEDIMENTS OF DEVELOPMENT AGENTS ON NATURAL RESOURCE CONSERVATION: MERTULEMARIAM DISTRICT CASE STUDY, NORTH CENTRAL ETHIOPIA

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Abstract

In Ethiopia, there is scanty information on scientific evidence regarding the role of Development Agents (DA) in natural resource conservation and the linkage with farmers and challenges hindering their activities with regards to natural resources conservation. Therefore, the aim of this study was to investigate impacts and impediments of development agents on natural resource conservation in Mertulemariam District, North Central Ethiopia. Respondents were selected based on random sampling technique, and questionnaire, interview and observations were employed to gather data. Results reveal that DAs have made great efforts to bring integrated natural resource conservation in the study area. They brought training and advice on natural resource conservation. Also, they accomplished both physical and vegetative conservation measures. However, heavy work load, low morale, low salary and unattractive career path, lack of technical knowhow, lack of disciplinary boundaries in one hand and lack of inputs, lack of logistics, farmers unwillingness and disobedience on the other hand were the inter-linked and prominent challenges hindered DAs. Finally, the study recommended that provision of in-service training, promotion, frequent follow up and technical support to DAs is very crucial. Likewise, improving logistics, increasing the number of DAs and refrain them from extra works should be given utmost attention.

Key Words: *Development Agents, Natural resource, Conservation, Impacts, Impediments, Ethiopia*

Introduction

In Ethiopia, natural resource conservation works were started in 1970s and passed to present time with different approaches (Gebregziabher *et al.*, 2016; Wolancho, 2015; HNCJ, 2013; Bewket, 2003; Herweg, 1999). Following severe land degradation in highlands, notable

lessons were drawn about land degradation problems, their extent and consequences for the environment and agriculture (Tedla, 2007; Bishaw, 2001; Desta, 2000; Osman *et al.*, 2000). Between 1970 and 1980s, considerable efforts have been made

to rehabilitate degraded environments and stop further degradation and emphasis had been on construction of mechanical SWC measures in cultivated fields and the afforestation of hillsides (Herweg, 1999). In the last decade, resource conservation activities, mainly soil and water conservation works in cultivated fields, have been undertaken as part of the agricultural extension package of the present government of Ethiopia (Bewket, 2003, Dejene, 2001).

Agricultural extension is used as an instrument for achieving the poverty reduction, food security and sustainable management of resources in the country (MoFED, 2010; Rahmato, 2008). Agricultural extension staff are involved in multiple activities of agriculture and rural development. Development Agents (DAs) are among the main actors of the extension system (Gebreselassie, 2014; MoARD, 2010). They are expected to provide adequate knowledge, practical skill and demand based advisory services at the *kebele* level (MoANR, 2017; Abate, 2008). Besides supporting and training farmers on resource management and improved farming techniques, they provide more services which directly or indirectly influence agricultural production and productivity (MoARD, 2010). Their role is critical in creating modern farming communities (MoANR, 2017).

Moreover, to assist farmers and pastoralists acquiring technical skill and knowledge in the management and conservation of natural resources, farmer-training centers (FTCs) have been established in rural areas (MoARD, 2010). These centers are staffed with middle level professionals named as Development Agents, trained with issues

related to natural resources management (such as afforestation, natural area conservation work, organic fertilizer preparation and organic production (Amsalu, 2015). They are assigned to give training and advice in their respective field of study to farmers (Kassa and Degnet, 2004).

As UNEP (2000) pointed out, natural resources can be conserved if it is supported by an educated and informed public. This implies that education plays great role in shaping decision people make on the use of natural resources. In this regard, DAs are critical actors in serving the community and expected to change farmers' knowledge, skill and attitude through disseminating up-to-date information necessary in taking informed decision towards improving their livelihood and conserving natural resources (Asayehegn *et al.*, 2012).

Recently, natural resource management and conservation has been taken up as an important intervention for reversing degradation of resources in all parts of Ethiopia (Wolancho, 2015). The overwhelming proportion of these activities is accomplished through popular participation (mass mobilization) and DAs have pivotal role in mobilizing and coaching the farmers (Wolancho, 2015; Bewket, 2003). However, little is known in terms of scientific evidence regarding the role of DAs in natural resource conservation, the linkage with farmers and challenges hindering their activities. Therefore, the aims of this paper are: to explore the role of DAs in bringing the natural resource conservation into practice and to analyse the challenges that hinder DAs in carrying out their work.

Materials and Methods

Study Area

Mertulemariam District is located between 10° 40`- 11° 15`N and 38° 15`- 38° 30` E with a total area of 971km². It is one of the districts of East Gojjam zone of Amhara region, North Central Ethiopia. The capital of the district, Mertulemariam town, is found 195 km from Debre Markos (the capital of East Gojjam zone), 180km from Bahir Dar (regional capital) and 365 km from Addis Ababa. Abay River is the natural boarder separating the district from South Wollo zone (Fig. 1). The district has undulated and very rugged terrain which accounts about 45% of the total area. Mountains, plains and valleys comprise the remaining 30%, 20% and 5%, respectively. The altitude of the district ranges from 950 m.a.s.l., at the bottom of Blue Nile river valley, to 3660m.a.s.l. at the top of mount Aba Minyos (Agriculture and rural development office of Mertulemariam district (ARDOMD), 2014).

The district has mean annual temperature of 20-25°C. Rainfall is characterized by one rainy season, from June to September. In some occasions, small amount of rain can occur in May and October, i.e. at the beginning and end

of the rainy season. However, the area obtains maximum amount of rain only in the rainy season. Nitisols, luvisols and leptosols are the predominant soil types in the area (ARDOMD, 2014). Mixed farming is the dominant economic activity of the kebele. Most people are engaged in both traditional crop production and livestock rearing. The main crops grown in the area are *teff*, wheat, bean, barley, maize, chickpea, sorghum, lentil and pea. Likewise, cattle, equines, sheep, goats and poultry are major livestock resources reared in the area. The major land use patterns in the kebele are cultivable land, grazing land, settlement, forest and bush land and marginal land. The proportion of cultivable land dominates others by far, which is about 76% of the total. In the area, land distribution was conducted during the Derg (the socialist) regime and under the current government. The land redistribution process, which was carried out in 1997, grouped the society into five classes: Bureaucrats, the Ruminants of feudal regime, the Rich, the Middle and the Poor peasants. The first two groups gained only one hectare of land irrespective of their family size, whereas the rich groups occupy three hectares (ARDOMD, 2014).

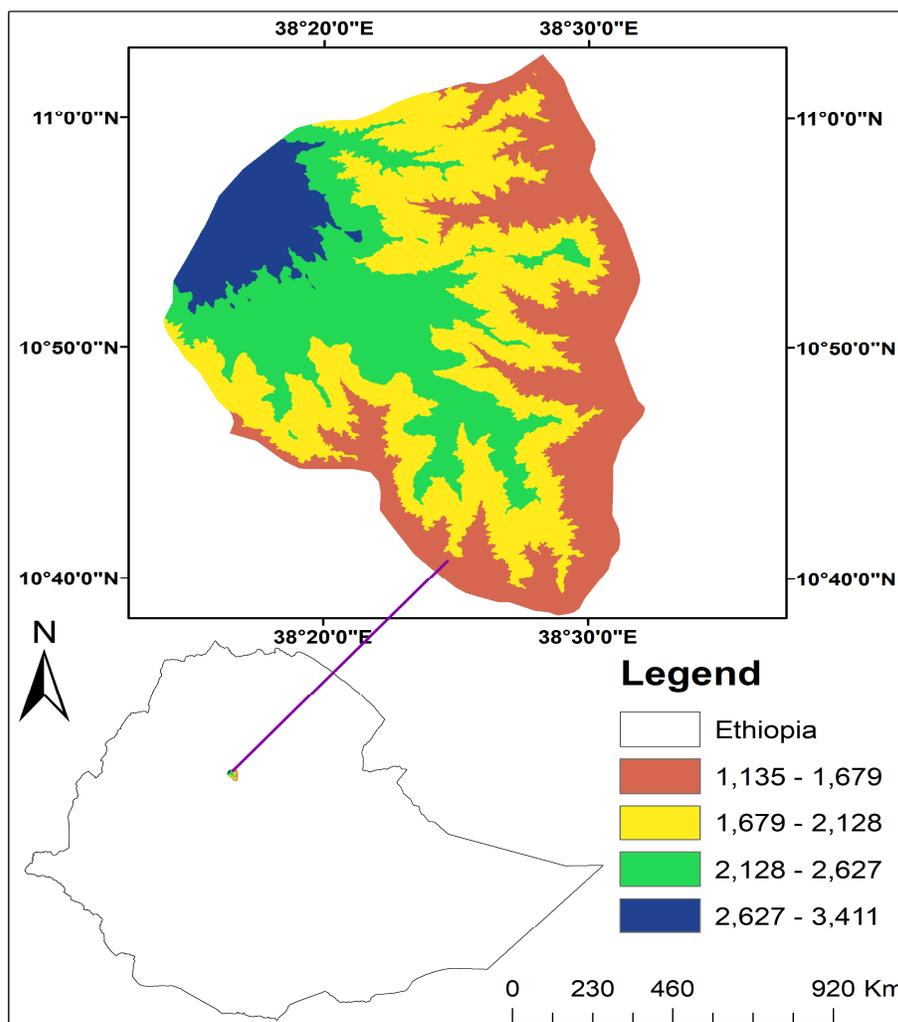


Fig. 1: Location of Mertulemariam District

Sampling Technique and Procedure

This study was conducted in two peasant associations (*kebele*) of Mertulemariam district. The two kebele were selected purposely mainly for two reasons. The first reason was familiarity of the researcher to the study area. As the researcher recognizes the socio-cultural conditions of the area, it was easy to collect the required data. Secondly, as low land parts of the area comprise much part of the district, one *Kebele* was selected from tropical areas,

and the other from sub-tropical, as it covers larger areas of the district next to tropical areas.

Having selected the two *kebele*, the researcher had employed simple random sampling method and sample respondents were selected by applying the principle of proportional sample selection method. Accordingly, of the total 1938 HHs (household heads), 137 sample respondents were selected by taking 7% of the total (Table1). This was

determined by the following formula (Kothari, 2004).

$$nh = (Nh/N) \times n$$

Where; nh= sample size of each kebele

Nh= total population of each *Kebele*

N= total population (i.e. total HHs)

n= total sample size

Table 1: Sample *Kebele* and sample size determination

Sample <i>Kebele</i>	Number of HHs in each <i>Kebele</i>	Sample size
Addis-hiwot	940	66
Addis-alem	998	71
Total	1938	137

Data Collection Tools and Methods of Analysis

To carry out this study, both primary and secondary data sources were used. Primary data were collected through household survey questionnaires, interview, and field observations. In this regard, Six DAs selected from the two kebele (three from each) and five agriculture and rural development officers of the district (natural resource management experts) were interviewed; and six model farmers were selected as key informants. In addition, structured questionnaire was employed to sample respondents. All participants in interview and survey were selected in an informed consent and they were above 18 in age. Finally, in SPSS environment, descriptive statistics was used to analyze the data.

Results and Discussion

Socio-economic Characteristics of Respondents

Of the total sample of population, 88% were males and 12% were females. Among respondents, 66.4% were in age range between 31 and 60. The remaining 16.1% and 17.5% found in age group of above 60 and below 30 years, respectively (Table 2). This has positive relation with resource conservation, given the fact that, as age goes up, knowledge

and concern about environment and resources increase. Likewise, as Table 2 shows, the proportion of married respondents outweighs the others. While married respondents accounted for 81.7%, the divorced, single and widowers accounted 6.5%, 7.4% and 4.4% respectively. As people get married, the probability of bearing children is high. Thus, this leads to increase in pressure on the locally available resources.

Regarding the educational level, most of respondents were unable to read and write. Respondents who were able to read and write accounted 17.5%, while respondents who completed primary and second and above accounted for 7.3% and 2%, respectively (Table 2). This could impose negative effect on resource conservation. Resources can be more conserved if there is good knowledge and awareness up on the society and vice versa. On the other hand, the average household's size of the respondents lied between 5-7 family members that accounted for 55.5% of the total. Most of the respondent (66.4%) had family member greater than five (Table 2). This is associated with educational level of households. As educational status of households was low, the extent of using family planning program was less. Likewise, as family size was large

demand for resources increased, this in turn led to over exploitation of resources. Mixed farming was the main economic activity in which majority of people

achieved their livelihood. Most people in the area practiced production of both crop and livestock rearing (Table 2)..

Table 2: Respondents Socio-economic Characteristics

Variable	Frequency	Percentage
Age <30	24	17.5
31-45	47	34.3
46-60	44	32.1
> 60	22	16.1
Marital status		
Single	10	7.4
Married	112	81.7
Divorced	9	6.5
Widowed	6	4.4
Educational status		
No schooling	100	73
Read and write	24	17.5
Primary school (1-8 grades)	10	7.3
secondary and above	3	2
Family size		
<2	11	8.1
3-5	35	25.5
5-7	76	55.5
> 7	15	10.9
Means of livelihood		
Crop production	16	11.67
Mixed farming	119	86.86
Livestock rearing	2	1.45

Farmer-DA Linkage in Mertulemariam District

Of all respondents, 43.8% respondents replied that they had got training and advice about natural resource conservation. Despite this, few of them replied that the training and education was sufficient (Figure 2). Regarding to this, most of the farmers claimed as follows: “We have willingness to accomplish conservation works but we have little knowledge. The knowledge we have is not sufficient. Therefore, we need training and support from experts. Then after, by following their advices, we can

participate. Our role is to contribute labor. The experts bring input materials and knowledge.”

From the above premise, it is possible to conclude that the major factor hindered the participation of farmers on conservation activities were lack of knowledge and awareness about natural resource conservation. This in turn was attributed from less follow up and technical advice of DAs. Concerning this issue, most of the respondents agreed upon the fact that DAs were very few, so that they visited and helped farmers less frequently. As they could not give

expertise support and advice to every farmer, DAs preferred to work closely with some farmers who were member of development team leaders. In line with this, some of the respondents articulated as: “Most of the time DAs spend their time in office. We have not seen them while they help farmers. Even, when they come to field, DAs tend to give advice to farmers who are member of development team leaders. As a result, we are accomplishing both conservation and agricultural farm works with ourselves”.

However, it was found contradictory idea between farmers and DAs. The DAs complained as: “Farmers sometimes do not want to take part in trainings and meetings, even if they come, farmers often come too late. Sometimes it is very difficult to work with them.” In the same manner, Natural resource management officer of the district claimed as farmers disobey DAs in the following way: “In some occasion farmers do not trust experts. They tend to keep their own interest. Thus, the experts need to be tolerant for that matter.”

The issue was reflected on both sides: farmers blamed DAs and DAs in turn blamed farmers, so who should be responsible? It is possible to conclude that DAs did not help and give training and advice properly. Asked how often do they visited and assisted farmers, most DAs responded that they visited and assisted farmers once in a month. Interesting enough, all DAs responded that they could not give technical assistance and advice to every farmer frequently because of their number. Therefore, they preferred to work closely with farmers who are development team leaders. This result is in consistency with Amsalu (2015) finding which dictates that for small DAs are in number, the number of farmers they are supposed to reach is too many for a meaningful delivery of the service. Similarly, World Bank and MoARD (2007) found that there is no strong functional links between DAs and the community and DAs at all levels lack capacity in participatory planning technique related to natural resource.

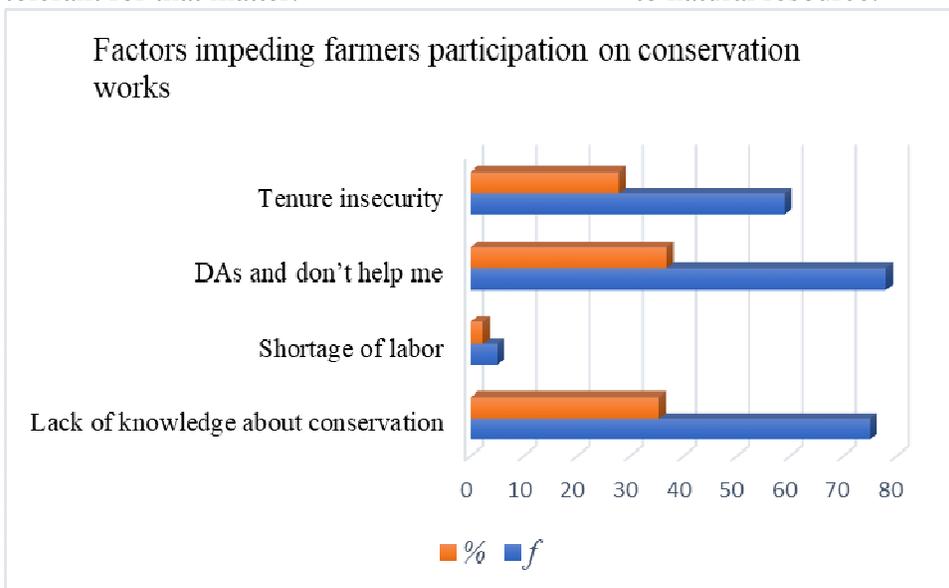


Fig. 2: Factors hindering farmers participation on conservation works

DAs and Natural Resource Conservation Practices in Mertulemariam District

Efforts were under way to rehabilitate degraded areas and culminate degradation of resources in the study area. Afforestation of the communal hill sides unsuitable for agriculture, provision of seedlings to farmers for private planting, advising farmers about agro-forestry practices and construction of soil and water conservation structures in cultivated fields were the major natural resource conservation activities under taken in the present study area. Asked what their primary task regarding natural

resource conservation was, DAs replied that watershed management was the first and foremost activity they accomplished with respect to natural resource conservation. Through the process of watershed management, the nature of the land studied, and solution proposed accordingly. Following this, structural and biological conservation techniques were exercised after the survey had made. In some upland areas, hillside plantations, hill side terraces, diversion ditches, stone and soil bund were made (Figure 3). Likewise, areal enclosure was made in some areas to rehabilitate degraded land.



Fig. 3: DAs and farmers on conservation works

The results of key informant interview showed that DAs had used different methods to protect the remaining forests and rehabilitate

deteriorated areas. Primarily, they tried to train and advice about use and coverage of forests by comparing the present with the past. Furthermore, with the help of

the community, DAs had assigned some individuals to protect forests from illegal cutting. Similarly, DAs had selected seedling nursery site and planted seedlings. in some areas. As DAs articulated, seedling nursery had been carried out as an important method to

rehabilitate deteriorated forests and afforest new areas. In this regard, DAs accomplished tasks such as selection and preparation of seeds, selection of vigorous and healthy seedlings, and sowing of seeds on seedbeds (Fig. 4).



Fig. 4. Biological conservation measures

Challenges Facing DAs in Mertulemaria District

The interview and observation results indicated that DAs suffered toilsome and dyslogistic conditions that hindered them to properly carryout conservation works. They were working under conditions which foster low morale, lack of mobility, virtually no equipment, inadequate incentives and an unattractive career path and heavy workload. Deficits in housing, transportation, equipment, and communication were not serious

constraints that limit the time DAs spend with farmers. Moreover, despite the presence of the DAs at kebele level each with different expertise, there was no disciplinary boundaries. They were forced to tasks for which they were professional. Supporting this idea, MoARD (2010); World Bank and MoARD (2007) dictated as an animal science DA was obliged to advise on soil and water conservation measures and crop specific tasks. Likewise, the DAs were performing extra tasks such as:

collecting taxes, delivering credits and promoting political agenda of the government. This led to unclear line of command that often put the DAs to perform difficult tasks and undefined position with communities they serve. This result agrees with the findings of Davis *et al.* (2010) which states as apart from their main duties, the DAs are expected to engage in additional activities such as distribution of fertilizer, collection of credit and taxes, and other government activities that do not typically fall under the mandate of extension.

In the study area, the DAs were very small in number. As a result, they could not give technical support to every farmer. This condition led them to work closely only with some farmers who were leaders in development team, and pay little attention to other farmers. On the other hand, farmers unwillingness to conservation works, shortage of finance, and the lack of technical knowhow on some conservation technologies were the major problems facing DAs.

They rather complained that the conservation structures were not suitable for oxen to turn while plowing, consume and fragment their land and structures created favorable conditions for the reproduction of rodents. Moreover, financial constraints were also major factors hindered conservation activities. Shortage of financial inputs had bound DAs and the community to construct modern conservation structures. As the community was divided in to beneficiary and non-beneficiary of safety net program, it was challenging for DAs to carry out conservation activities with two separated groups. Beneficiaries of safety net program accomplished conservation

works in good manner while non-beneficiaries did not. This shadowed the interest of farmers to exercise conservation activities by their own interest without incentive in the long run. On the other hand, overlap of other development plans had diverted the attention of DAs to other works than conservation work. The overlap of unscheduled meetings also interrupted the conservation activities. These results are in line with findings of similar studies done so far (Gebresilasie, 2014; Asayehegn, *et al.*, 2012; Kassa and Degnet, 2004).

As interview results showed, sustainability of conservation structures was the very problem to natural resource conservation in the area. Farmers' willingness to maintain and reconstruct the prepared structures was very low.

Conclusion and Recommendations

As the findings of the study shows, many natural resource conservation efforts have been going on in the study area. The DAs have made great efforts to bring sound natural resource conservation activity for the society. They have made all their endeavors to conserve soil, water and forest resources by coordinating and coaching farmers. Stone and soil bunds, terraces, contour plowing; check dams and areal closure were exercised. Likewise, the DAs made selection of seedling nursery site, provision of seedlings and planting trees and areal enclosures. However, heavy work load, lack of inputs, poor road network, unsustainability of conservation structures, lack of disciplinary boundaries, low morale, inadequate incentives and an unattractive career path, lack of technical follow up and

support are the inter-linked challenges facing DAs in the study area. Therefore, the government should coin motivation or incentive mechanisms to retain DAs in their profession, build their capacity, promote their moral and refrain them from unprofessional tasks. At the minimum, basic facilities such as housing, transport, uniforms and office materials must be provided to maintain decent working conditions for DAs.

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