

Overarching Training Needs on Farm Infrastructures and Participation: A Case Study of Irrigation Scheme Beneficiaries in Zanyokwe, Eastern Cape South Africa

Agholor Azikiwe Isaac

*Department of Agricultural Extension and Rural Resource Management,
University of Mpumalanga, Private Mail Bag X11283, Mbombela – 1200, South Africa*

KEYWORDS Decision-making, Farm Characteristics, Relationship, Resources, Smallholder

ABSTRACT The paper examined the role of smallholder irrigation scheme beneficiaries in training decision making and the relationship between farm characteristics and participation in training on the use of farm infrastructures. The study adopted purposive sampling techniques with a total of 44 male and 16 female farmers sampled from the population. The data collected were subjected to screening for analysis. In other to determine the statistical relationship between farm characteristics and participation in training, logistic regression analysis was used. Findings shows that there is a very strong relationship between the sizes of allocated plots to farmers in the irrigation scheme and participation in training. The result of the study revealed that Farm Experience (p -value = .001) and size of allocated plots (p -value = 0.002) has significant relationship to farmers' participation in training. The study concluded that the training of farmers has the potentials of increasing the efficient use and maintenance of farm infrastructures for effective optimal production.

INTRODUCTION

The problems enunciated by smallholder irrigation schemes beneficiaries are numerous and cut across factors such as inadequate resources, technological know-how, plot size, farmers profile and marketing prospects (Denison and Manona 2007). The differences among irrigation schemes, call for different approaches for interventions required in responding to the different needs, ranging from inadequate infrastructure and training (Van Averbek et al. 2011). Irrigation Management Transfer (IMT) was initiated to abdicate the task of supervision, operation, training and maintenance of schemes to the farmers. Nevertheless, to effectively handover these tasks to farmers, the need for regeneration of existing irrigation scheme became prominent. World over, IMT were also designed and instituted as a method in smallholder scheme management with the main aim of reducing govern-

ment expenditures on operation and maintenance and to increase profitability (Shah et al. 2002). The non-inclusion and integration of the numerous needs of the scheme beneficiaries before upgrading of technology in the scheme contributed to the recurring failure of government effort in assisting farmers (Denison and Manona 2007). Though the different smallholder irrigation schemes that was known to have existed was suggestive; it gave insights into the current position and can be used in identifying areas of needs assessment of farmers in most schemes. Denison and Manona (2007) asserted that the alteration of pump sprinkler to pumped overhead systems in most smallholder irrigation schemes encouraged commercialisation and intense drive for more irrigated land. The emergence of commercialisation agenda gave rise to the removal of the less privileged group of farmers such as the food-plot holders because they could no longer operate in the scheme at a higher cost. As noted by Denison and Manona (2007), the various innovative models used which was not matched with training made most smallholder beneficiaries to change to higher-value crops so as to be able to meet the cost of water tariff, electricity bills and administration cost at the expense of medium-value crops such as vegetables. Nevertheless, irrigation consultants were of the opinion that this model should not be

Address for correspondence:

Agholor Azikiwe Isaac
Faculty of Agriculture and Natural Sciences,
Department of Agricultural Extension and Rural
Resource Management,
University of Mpumalanga,
Private Mail Bag X11283,
Mbombela - 1200 South Africa
Telephone: +27(0)786283593,
E-mail: isaac.agholor@ump.ac.za

used as an alternative for new schemes or form part of an agenda towards the regeneration of existing scheme (Laker 2004). However, this upgraded model has been introduced in some schemes in most province in South Africa (Umlaba 2010). In many instances, the state of canal schemes which has not been ungraded is somewhat not the same. In general, canal schemes as noted by Mohamed (2006) has low operating cost and as such accommodate smallholder farmers who does not have enough capital for farming. Therefore, the revitalisation of such canal scheme is not critical as it gives farmers the option of using any available farm resources (Averbeke et al. 2011). The appropriate identification of the training needs and engagement of farmers in training on ways to improve the smallholder irrigation scheme is important given the income generated from the scheme. However, non-formal training aimed at preparing farmers for skills needed in agriculture must be prioritised (RDS 1996). Capacity development for most community centred organisations that are representing the smallholder farmers should be accorded priority so as to ameliorate some of the constraints to sustainable agriculture. Capacity building for smallholder farmers using cooperatives will also assist in increasing output because pooling resources together may generate internal economics of scale which will improve performance (OECD 2006). Nonetheless, in South Africa the development of smallholder irrigation schemes has been problematic for the past 20 years because of the dearth of irrigation infrastructures, inadequate training and mismanagement (FAO 2002). Total absence of training on the use of irrigation infrastructure gives way to water wastage and water use inefficiency thus affecting the sustenance of smallholder farming in South Africa (Shah et al. 2002). According to Van Averbeke (2008), capacity development in the area of physical capital is insufficient to bring about a change in smallholder irrigation development in South Africa. The training of farmers on how to use irrigation infrastructures is central to meeting the overarching objectives of alleviating poverty in South Africa. Therefore, the necessity to examine smallholder farmers' participation in training and the relationship between farm characteristics provided the theoretical basis for this study.

Research Objectives

The paper aimed at determining the participatory and advisory role of smallholder irriga-

tion scheme beneficiaries in training and the relationship between farm characteristics and farmers' participation in the scheme. As indicated in the reviewed literature, the study assumed that inadequate training of farmers on how to use irrigation infrastructures defies the overarching objectives of increasing farm yield. Therefore, the objectives of the study were:

- (1) To examine the level of smallholder farmers participation in training
- (2) To investigate the relationship between farm characteristics and participation in training

METHODOLOGY

Research Approach

In line with the objectives of examining the level of smallholder farmers in participation in training and to investigate the relationship between farm characteristics and participation in training, the study applied quantitative research methodology involving structured and semi-structured questionnaires. The 5 point Likert scale- consisting of Most Often, Very Often, Undecided, Often and Less Often were used to draw information about respondents' level of participation in training. The study also used the focus group discussion to further fill the possible gaps that may have emanated from the use of quantitative approach and to obtain a probed evidence. Secondary literature related to the topic were also extensively reviewed. The adopted approach gave the researcher the chance to gather all relevant evidences, views and perceptions about the topic under study (Creswell 2005).

Sample and Sampling Techniques

The study adopted purposive sampling techniques because not all farmers in the area were beneficiary of the scheme. A total of 44 male and 16 female farmers were sampled from the population.

Data Analysis

The data collected from the respondents were subjected to screening for analysis. After the screening, the data was analysed by computing the frequency, percentages and mean. The Statistical Package for Social Sciences (SPSS version 21) was used. In order to deter-

mine the statistical relationship between farm characteristics and participation in training, logistic regression analysis was used. Likert scale was also adopted in determining the level and role of participating farmers in training.

RESULTS

The findings from the analysed data indicated that 21.67 percent of the respondents participated in crop planting training while only 23.33 percent undertook training in harvesting. The number of trainees for fertilizer application methods were not very encouraging as only 11.67 percent participated while 3.33 percent participated in diseases and pest control training. Results revealed that twenty-five percent of the respondents had training that lasted between 1-2 days. In the contrary farmers, farmers who had longer duration of between 3-5 days of training were 12.5 percent. The decision making on training needs of scheme beneficiaries were handled by the scheme management committee, thus rendering participating farmers as mere flaccid participants. The beneficiaries' participation in training were determined using the 5-point Likert scale (Most often, Very often, Undecided, Often, Less Often). Four percent of respondents asserted that they participated in training decision making and the 'Less often' category were thirty percent. From this findings, it is explicit that most farmers who are beneficiary of the scheme had little say in the planning and implementation of training programmes.

From Table 1, findings shows that there is a very strong relationship between the sizes of allocated plots ($p\text{-value} = 0.002$) to farmers in the irrigation scheme and participation in training. Anecdotal evidences from group discussions held with farmers' shows that most of them do not possess the required competence to take a good advantage of the fully irrigated plots of land given to them. Denison and Manona (2007)

asserted that resources allocated for training of smallholder farmers should be increased considering the role smallholder farmers play in rural economies. The impact of training farmers on the use of farm infrastructures have long been yielding goods results in the areas of increased crop production. Training on the use and maintenance of farm resources helps to support feeble farming communities and enhance livelihood. The result of the study as indicated in Table 1, also revealed that the Farm Experience ($p\text{-value} = .001$) has significant relationship to farmers' participation in training. Farmers with more years of experience are disposed and more willing to participate in training. The result implied that for every unit of increase in plot holders farm experience there is 1.012 decreases in the long odds of participation in training. Sufficient training is required for farmers to assume adequate responsibility in the running of their farms and become less responsive and dependent of public extension services for managerial assistance (Backeberg 2006). Farmers requires a comprehensive training in a variety of farming practices.

DISCUSSION

Though there were evidences to substantiate that there was general satisfaction with training given to the farmers; extension officer seldom conduct these training session. However, irrespective of training administered, there were still significant gaps and loopholes which was apparent during the focus group discussion conducted. The result shows that farmers requires training in pest management control, infrastructure maintenance and marketing. From the findings, it is obvious that decisions made about training were unilateral and does not totally involve scheme beneficiaries. The strengthening of farmers' influence on training decision making through social conscription using structures like farmers' cooperatives is envisaged to

Table 1: Logistic regression showing relationship between farm characteristics and participation in training

Variables	B	S.E	Wald	df	Sig.	Exp(B)
Age	-.762	.781	.952	1	.329	.467
Level of education	.395	.289	1.871	1	.171	1.484
Size of allocated plot	.970	.371	6.836	1	.002	2.637
Farm experience	-1.012	.292	12.007	1	.001	.364
Plot ownership	-.123	.374	.109	1	.741	.884

Note: The variables in which there are significant relationship between farm characteristics and participation in training. *** = at 0.01, ** = at 0.05, and * = 0.10 levels of significance.

connect the gap between extension practitioners and smallholder farmers. Social conscription if properly put in place, will not only increase farmers' negotiating ability with government but also assist in retrieving farm resources like farm equipment, inputs and farm credit. An ideal institutional prototype that encompasses sub-committees, like private and NGOs as integral linkage structure are already in place in the Eastern Cape. This idea is put in place to complement farmers existing skills so as to enhance pooling of ideas and resources together for effective utilization. As indicated in the regression analysis, farm experience were significant to participation in training. Most farmers with higher experience in farming are well informed on the need for further training in maintenance of farm infrastructure and are critical in evaluating inherent opportunities available in the farming sector (Chilot 1994). This findings is also consistent with the findings of the study by Enete et al. (2002) which discovered that experienced farmers are very disposed in making well informed decisions on training.

The size of allocated plots to farmers also shows significant association to participation in training. According to Najafi (2003), farm size has influence in decision making and participation in training. This is also supported by the study of Taha (2007) which posited that the sizes of irrigated land justifies the need to participate in training and decision making. Farmers with bigger plot sizes has a higher return on investment and are more inclined to participating in training on the use of farm infrastructures. The findings reveals that the average plot size were inadequate and consequently the outcome of increased plot size may be linked to the probability of participation in training. This findings lead credence to the result of the study of Darr and Uirbrig (2004) which observed that small plot sizes discourages farmers. However, indication are that the smaller the plot, the more the chances of farmers renting out their food-plots and are less likely to participate in training. This result also agrees with the findings of Arnold (1991) which indicated that with decrease in plot size, farmers become more reliant on off-farm engagements.

CONCLUSION

The paper examined the participatory and advisory role of smallholder irrigation scheme beneficiaries and the relationship between farm

characteristics and farmers' participation in training. The training of farmers has the potentials of enhancing access to the maintenance and use of farm infrastructures for effective optimal production. Smallholder farmers must be represented in training decision making to allow generated interest and participation. Beneficiaries in the scheme requires full representation in plot allocation procedures and other policy changes that has relevance to plot allocation. The strategies to be adopted in training implementation must not be already-made but should allow full participation of smallholder farmers or scheme beneficiaries. The complementary role of farming communities and their involvement in operative training on water use efficiency for example will assist in bringing about a sustainable smallholder farmers' irrigation practice. Nevertheless, it is uncertain if these positive conceptions are taken on board when executing irrigation plans in South Africa. The World Bank assessment and evaluation of achievements in smallholder irrigation schemes in the Sahel observed that incentives and participation of farmers in training are critical and are linked to farmers' success. For operational and enhanced training, the need of harmonizing all existing departments related to smallholder irrigation schemes is necessary. Despite the associated constraints of smallholder irrigation schemes, participating farmers consider it as an efficient source of livelihood. Although mediating policies at the National and Provincial levels remains less supportive, a number of initiatives has been put in place to savage the ailing situation of smallholder irrigation farmers. These supportive initiatives includes the tariff regulation on water in catchment areas. Suffice to mention that training is essential on the use of water in smallholder irrigation scheme. In South Africa, farming or agricultural practices is the major consumer of water and measures to control water use is critical. In pursuit of water conservation and resources management, the Water Research Commission (WRC) has already pioneered investment on water infrastructures that will support water managers to improve water use efficiency.

RECOMMENDATIONS

From the findings of the study, the researcher recommend that inclusiveness and due process of consultation is required for effective participation in training. Smallholder farmers should be steered and given the opportunity to

become active participants in determining their own developmental objectives rather than being passive recipients of innovative ideas from extension services. Since the average plot size allocated to each beneficiary is positively linked to the probability of participation in training; it becomes apparent that sizes of irrigated plots should be considered in planning. In increasing the plot sizes, the determinant of who gets what should be based on performance and yield output and efficiency in the utilization of already allocated plots. It is also the view of the researcher that smallholder irrigation scheme beneficiaries should form training linkages with other sectors like agricultural training institutes to enhance their skills in maintenance of farm infrastructure. Irrigated land in South Africa is considered a treasured asset but unfortunately infrastructure and training needs of farmers on the use of farm infrastructure is not optimally considered. The paper further recommends that farmers' training on the use of farm infrastructure should be prioritized and must be a continuous process. The training of farmers on how to use irrigation infrastructures is justified in meeting the overarching objectives of alleviating poverty in South Africa.

REFERENCES

- Arnold JEM 1991. Tree components in farming systems. *An International Journal of Forestry and Forest Industries*, 41(1): 6-11.
- Backeberg GR 2006. Reform of user charges, market pricing and management of water: Problem or opportunity for irrigated agriculture? *Irrigation and Drainage*, 55(1): 1-12.
- Creswell JW 2005. *Research Design: Quantitative, Qualitative, and Mixed Methods Approaches*. Thousand Oaks, USA: SAGE.
- Chilot Y 1994. *Factors Influencing Adoption of New Wheat Technologies in the Wolemera and Addis Alem Areas of Ethiopia*, MSc Thesis, Unpublished. Ethiopia: Alemaya University.
- Darr D, Uirbrig H 2004. Farm Forestry to Alleviate Poverty? Findings from Three Differently Developed Rural Economies in Central Laos. *Conference on International Agricultural Research for Development*, 5-7 October, Berlin.
- Denison J, Manona S 2007. Principles, Approaches and Guidelines for the Participatory Revitalisation of Smallholder Irrigation Scheme. Volume 2. Concepts and Cases. *WRC Report TT 308/07*. Water Research Commission, Pretoria, South Africa.
- Enete AA, Nweke FI, Tollens E 2002. Determinants of cassava cash income in female-headed households of Africa. *Quarterly Journal of International Agriculture*, 41(2): 2-5.
- Food and Agricultural Organization 2002. *Agriculture: Towards 2015/30. Technical Interim Report*, FAO, Rome.
- Laker MC 2004. Development of General Strategy for Optimizing the Efficient Use of Primary Water Resources for Effective Alleviation of Rural Poverty. *WRC Report No KV149/04*. Water Research Commission, Pretoria, South Africa.
- Mohammed SS 2006. *Livelihoods of Plot Holders Homesteads at the Dzindi Smallholder Canal Irrigation Scheme*. DTech (Agric.) Thesis, Unpublished. South Africa: Tshwane University of Technology.
- Najafi B 2003. An Overview of Current Land Utilization Systems and their Contribution to Agricultural Productivity. *Report of the APO Seminar on Impact of Land Utilization Systems on Agricultural Productivity*. Productivity Organization. Islamic Republic of Iran: Asian Government Printers.
- Organisation for Economic Co-operation and Development (OECD) 2006. *Review of Agricultural Policies, South Africa: Highlights and Policy Recommendation*. OECD Publications 2 France 002006, 691 Page No. 83691, 2006. Worldwide Options for Institutional Reform in the Developing Countries. Rome: FAO.
- Rural Development Services (RDS) 1996. Reconnaissance Assessment of Agricultural Resources. SAI Platform, 2010. Water Conservation Technical Brief: TB6 Irrigation Scheduling. From <<http://www.saiplatform.org/uploads/Library/Technical%20Brief%206.%20Irrigation>> (Retrieved on 29 May 2015).
- Shah T, Van Koppen B, Merrey D, DE Lange M, Samad M 2002. Institutional Alternatives in African Smallholder Irrigation: Lessons from International Experience with Irrigation Management Transfer. *Research Report 60*. International Water Management Institute, Colombo.
- Shiferaw B 2006. Poverty and natural resource management in semi-arid tropics: Revisiting challenges and conceptual issues. *An Open Access Journal, ICRIT*, 1(2): 1-15.
- Taha M 2007. *Determinants of the Adoption of Improved Onion Production Package in Dugda Bora District, East Shoa, Ethiopia*. MSc Thesis, Unpublished. Ethiopia: Haramaya University.
- Umhlaba 2010. Smallholder Irrigation Development Guidelines. *WRC Report No. TT449/10*. Water Research Commission, Pretoria, South Africa.
- Van Averbek W, Denison J, Mkeni PNS 2011. *Smallholder Irrigation Schemes in South Africa: A Review of Knowledge Generated by the Water Research Commission*. South Africa: Centre for Organic and Smallholder Agriculture, Tshwane University of Technology.
- Van Averbek W 2008. Best Management Practices for Small-scale Subsistence Farming on Selected Irrigation Schemes and Surrounding Areas through Participatory Adaptive Research in Limpopo Province. *Water Research Commission Report TT 344/08*. The Water Research Commission, Pretoria, South Africa.