International Scholars Journals

African Journal of Pig Farming ISSN: 2375-0731 Vol. 12 (1), pp. 001-006, December 2024. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Northern Ugandan Pig Farmers' Utilization of Labor

Jendyose
Islamic University in Uganda, Mbale, Uganda

Accepted 8 December, 2024

Pig (Susscrofa domesticus) production is becoming a more significant source of food security and revenue for smallholder farmers in several sub-Saharan nations. This is explained by the increased likelihood of market monitoring for pork, which is fueled by population expansion, urbanization, and the shift in diet toward a higher proportion of animal protein per person. Consequently, one of the practical methods to lift smallholder farmers out of poverty and food insecurity is to increase pig production. Few research have been conducted on the distribution of innovative behavior and the socioeconomic factors that affect labor use in the region, despite the fact that there are many studies on the aspects of pig production, such as feeding, breeding, and space requirements. Finding the socioeconomic factors that affect the distribution of innovative behavior and the use of labor (family or hired) among pig farmers in Northern Uganda was the aim of this study. We characterized smallholder pig farmers in northern Uganda based on the type of labor they employed to produce pigs using a cross-sectional survey and descriptive analysis. We also investigated how the four aspects of innovation behavior—exploration, experimentation, adaptation, and modification—were distributed among these farmers. The findings showed that young, educated farmers who had numerous pigs, were part of a farmer group, had a smaller household size, and had non-farm jobs were more likely to use hired labor than those who did not. The proportion of farmers who displayed the various aspects of innovation behavior varied significantly. Therefore, the socioeconomic disparities among farmers that define the labor restrictions they experience should be taken into account when designing interventions to increase pig production through the use of hired labor.

Key words: Innovation behaviour, Labour utilisation, Pig production.

INTRODUCTION

The Worldwide, pigs (Susscrofa domesticus) play a significant role in the production of livestock. Since 2000, the production of pork in Sub-Saharan Africa (SSA) has more than tripled; Uganda produces 12% of the region's pig meat from over three million pigs per year (HarvestChoice, 2015). According to Tatwangire (2014) and Ndyomugyenyi and Kyasimire (2015), the central area has the highest concentration of pig rearing households (56%), followed by the western (30.1%), eastern (28.8%), and northern regions (14.2%). Pig production is increasing, which makes other agricultural sub-sectors more competitive for important production resources. Pig farmers must therefore continually decide how much money, land, and labor to devote to each business in order to meet the household's overall goal of having enough money and food security. The most crucial production factor for pig farming households, aside from land, is labor, which places limitations on management and production when it is scarce (Bedemo et al., 2013). In order to develop methods to boost the production of pork and other pig products, it is crucial to comprehend the labor allocation decisions made by farmers in the pig sub-sector. These treatments also call for innovation behavior, a crucial facilitator that enables farmers to maximize profits by optimizing combinations of agricultural inputs. The degree to which farmers, subject to social, economic, technological, and environmental restrictions, investigate, test, or modify a novel concept or technique, or enhance an established practice, is known as innovation behavior (Schiederig et al., 2011; Liao, 2017). Its four dimensions are as follows: (i) exploration of new practices, which is the search for innovations and technology; (ii) experimentation of new practices, which is the tendency to test new technology and notice subtle changes; (iii) adaptation of new practices, which is the process of acclimating new tools, practices, and technologies to local conditions, resource endowments, and individual and community preferences; and (iv) modification of

existing practices, which is the enhancement of existing practices (Popadiuk and Vidal, 2009; Tambo and Wünscher, 2014; Bragdon and Smith, 2015). According to Èandek-Potokar et al. (2017), farmer innovation is a game changer in the efforts to commercialize smallholder pig farming. The development of labor-saving pig production technologies, such as indigenous microorganisms (IMO) technology, which lowers the amount of labor needed to process and dispose of pig manure, is another way that innovation can lower labor demand. Farmers must experiment with novel pig rearing techniques, adapt them, and/or change current ones in order to innovate. To what degree pig farmers experiment, research, adopt new pig rearing techniques, or alter current ones is unknown, though. Although it is well known that a large number of smallholder farmers produce pigs primarily using family labor (Ciaian et al., 2012), little research has been done on the socioeconomic determinants that make them more likely to employ hired or family labor. Therefore, the goal of this study was to identify the socioeconomic factors that affect the distribution of the dimensions of innovation behavior among pig farmers in Northern Uganda, as well as the utilization of various forms of labor (hired or family).

MATERIALS AND METHODS

Study area

Between October and November 2018, this study was carried out in the northern Ugandan districts of Gulu and Omoro. The districts are 600–1,200 meters above sea level and are located between latitudes 32.4467° and 32.4920° E and longitudes 2.7152° and 2.8186° N. The majority of homes in the area only retain six to twenty pigs, making smallholder pig farming the predominant practice. 60% of the labor is done by women, and 64% of the households raise native pig breeds, which are mostly handled through tethering (Ikwap et al., 2014). The study was carried out in the Paicho Sub-County in Aswa County in Gulu, and in the Koro Sub-County in Torchi County in Omoro region.

Research design and sampling

Data from smallholder pig farmers were gathered for the study using a cross-sectional design. Because it is a one-time study strategy, the design was selected because it is economical with regard to both time and money (Levin, 2006).

To choose study participants, a multi-stage sampling procedure was used. First, a purosive selection process was used to choose two districts, followed by one sub-county per district. Due to reports of a profitable market and high turnover for pigs and pork in those administrative units, the sub-counties of Paicho (Gulu district) and Koro (Omoro district) were chosen (Ikwap et al., 2014).

Through simple random sampling, three parishes were selected from each sub-county. In Paicho sub-county, Pagik, Kal-umu and Kal- ali parishes were selected; while in Koro sub- county, Pageya, Labwoch and Guna parishes were selected. A complete list of all pig rearing households in the selected parishes was obtained from the respective sub-county headquaters and used to select the study sample of 239 respndents; the number which was determined using Yamane's formula (Yamane, 1967):

$$n = \frac{N}{1+Ne^2}, n = \frac{594}{1+(594x\,0.05^2)},\ n = 239$$

.....Equation 1 Where:

N = population, n = Sample size, e = Degree of confidence level at 95%.

The 239 respondents were distributed between Paicho and Koro in portions of 143 and 96 pig farmers, respectively, based on pig farmers total populations per district.

Data collection

A semi-structured questionnaire that had been pre-tested was used to gather primary data. Pre-testing was conducted on ten pig farmers in the Unyama sub-county, which was not one of the sub-counties to be investigated despite being close to the study area and having a comparable number of pig farmers. Following pretesting, questions that were consistently answered and understood by respondents were kept; questions that the researcher thought were crucial but had previously been left out were added. Repetitive and/or unnecessary questions were eliminated. In several instances, questions were rearranged to guarantee logical sequence. The local dialect, Acholi, was used to give the questionnaires, but English was used to record the answers. Face-to-face interviews with pig farmers conducted at their houses were used to get the data. By building a relationship with the respondents, we were able to clarify any unclear responses and ensure that all questionnaire items were answered. The survey included both closed-ended and Likert scale questions, asking respondents to score different items to make sure the questions were clear enough for them to answer. There were three sections to the questionnaire. Routine sociodemographic data (Table 1) and the type of labor employed in the pig enterprise were recorded in Part 1. The variables included the number of casual and permanent laborers hired annually, the use of family labor in the pig enterprise (1 = yes, 0 = no), and the hiring of labor for the pig enterprise (1 = yes, 0 = no). Data on pig production, marketing, and access to institutions and institutional services were collected in the second section of the survey. Farming experience (years), current pig stock (number of pigs), distance to the closest market, access to extension services (1 = yes, 0 = no), and credit availability (1 = yes, 0 = no) were the variables in this case. Data on farmer innovation behavior was gathered in part three and organized into four dimensions. A five-point Likert scale, with 0 denoting not at all, 1 seldom, 2 occasionally, 3 frequently, and 4 always, was used to score each of the 12 items used to gather data on innovation behavior (Sullivan and Artino, 2013). Since the used scale lacked a neutral point, the intensity of innovation was measured as it progressed from one end of a continuum to the other. (i) I am very interested in learning how to properly feed pigs; (ii)

I enjoy learning new ways to house pigs; and (iii) I like to take the chance of taking part in training on new methods of pig disease and parasite control were the items assessed on the Likert scale for investigation. The following were the items for experimentation: (i) I enjoy trying out new pig feed management techniques; (ii) I am typically the first of my classmates to try out new pig rearing techniques; and (iii) I enjoy trying out new methods for building pig housing structures. The following things were included in the adaptation dimension: (i) I modify new pig feeding techniques to accommodate my circumstances; (ii) I modify new pig housing practices to accommodate my circumstances; and (iii) I modify new parasite and disease control procedures to accommodate my farming circumstances. The final items for changing current pig rearing practices were: (i) I know exactly how to change current pig housing practices; (ii) It's simple to change current pig parasite and disease control practices; and (iii) I apply new information to change current pig feeding practices on the farm.

Data analysis. Gender, household head age (years), farming experience (years), household size, non-farm employment, distance to the closest market (kilometers), and education (years) were the independent variables examined for their ability to predict the usage of family or hired labor by smallholder pig farmers. While means, standard deviations, and t-tests were used to analyze continuous variables, frequencies, percentages, and chi-square tests were used to describe the categorical variables.

For studying the distributions of the four dimensions of innovation behaviour, indices were computed from Likert scale data from their respective items using the Equation 2:

To understand the level of exploration, experimentation, adaptation and modification in the study area, the farmers' innovation behaviour with respect to these dimensions was classified into five groups; namely none, low, medium, high and very high based on each respondent's exploration, experimentation, adaptation and modification index. No activity included farmers with a corresponding index of zero, 0.01-0.32 for

very high innovation behaviour with regards to the dimension of interest. The described classification was adapted with modifications from Tirfe (2014) and Chopeva *et al*. (2015)

RESULTS AND DISCUSSION

Smallholder pig farmers' characteristics according to the kind of labor they employ

In Age, household size, education level, group membership, number of pigs and off-farm employment significantly ($P< 0.05$) influenced pigfarmers use of different types of labour (Table 1).

Farmers who use both hired and family labour were significantly ($P< 0.05$) younger than their counterparts who use only family labour. This finding conforms to an earlier study in Nigeria by Echebiri and Mbanasor (2003), which reported that in Abia State, households who relied on only young people for provision of farm labour had less food production. This resulted from the fact that younger farmers were more likely than older farmers to engage in non-farm activities. Young farmers in the current study are more likely to contract labor for pig production because they devote a portion of their time to jobs that generate revenue other than farming. This finding suggests that younger smallholder pig farmers are more likely than their older counterparts to generate more job possibilities for their peers. The size of the household had a substantial ($P<0.05$) impact on how much family labor was used by pig producers. Large-family farmers typically relied entirely on their family members to provide the labor required, whereas small-family farmers employed outside help to raise pigs. This outcome is in line with research by Nmadu and Akinola (2015), who discovered that family size significantly influences the availability and use of farm labor among Nigerian crop producers. According to this finding, smallholder farmers value having wives and/or kids in order to secure this labor source. Therefore, households with larger family sizes have more labor available for pig production than households with smaller family sizes. However, the current study did not examine whether households made efficient use of the large number of workers provided by large families for the production of pigs.

The utilization of family or hired labor was significantly impacted by education ($P<0.01$). Compared to farmers who just employed family labor, those who used both hired and family labor had substantially higher levels of education. Higher educated farmers are more likely to work outside the farm, according to reports (Alassaf et al., 2011).As a result, these farmers are less involved in agricultural operations and are more likely to use hired labor to produce pigs. This finding suggests that education improves a farmer's capability to absorb, understand, and apply information that is pertinent to judgments on farm labor.

Group membership had a big impact on the kind of work that pig farmers did. While some employed both family and hired labor, the majority of farmers (41.00%) who were part of groups only used family labor. In Acholi, the term "aleya i poto" (meaning "labor round") referred to the practice of farmers working together in groups. By increasing labor availability, this farmer peer support practice within groups lowers the demand for and perhaps lowers the cost of hired labor. Therefore, among smallholder pig farmers in northern Uganda, being a member of a farmer group may improve the supply of labor and lower labor costs.

The usage of the two forms of labor by pig farmers was also considerably impacted by off-farm employment. Only a small percentage of pig farmers with off-farm jobs (12.97%) employed only family labor; the majority (44.77%) used both hired and family labor. This is due to the fact that off-farm work provides pig farmers with extra cash that they can utilize to grow their pig production business, necessitating the hire of additional workers to augment family labor.

The number of pigs, or the size of the pig herd, statistically affected how farmers used the various forms of labor. More labor

was needed by farmers who raised a large number of pigs to handle the different management tasks. As a result, they were more likely than individuals with little holdings to need hired labor. The ability of farmers to recruit and oversee additional labor to supplement family labor in specific situations should therefore be supported by interventions aimed at commercializing smallholder pig production.
The type of labor employed by smallholder pig farmers did not change significantly according to gender, market distance, loan availability, pig rearing experience, or access to extension services.

Distribution of the dimensions of innovation behaviour.

Exploration, experimentation, and adaptation were all skewed to the left, but only changes to the current methods of pig rearing were distributed normally. All farmers demonstrated some degree of exploration, according to the results in Figure 1, and the majority of them (86.61%) scored extremely highly on this innovation behavior characteristic.

The proportion of farmers who displayed the various aspects of innovative behavior varied significantly (Fig. 1). This indicates that neither mutual exclusion nor collective exhaustion existed in the distribution of innovation behavior aspects. This meant that a farmer could only explore and not try the other dimensions. However, a farmer does not have to investigate or test a method before changing an existing pig rearing practice. For agricultural researchers, extension agents, and policymakers, this finding has significant ramifications. Smallholder farmers may not always adopt and utilize new technologies and innovations more effectively just because they are available (Lemessa et al., 2018). As a result, implementing new agricultural technologies may need addressing other issues that restrict farmers' goals, like insufficient market connections and restricted financial availability.

With a very high experimentation score, experimentation had a significantly lower number of farmers (47.28%) than exploration. Since exploration is merely observing or listening to what other people are doing or saying without necessarily taking the initiative to try out or change the same, the majority of farmers (86.61%) were found to be quite exploratory. This finding suggests that smallholder pig farmers may find it simpler to attend trainings and/or extension meetings than to put what they have learned into practice (Moschitz et al., 2015). As a result, in order to encourage farmers to try out new pig rearing techniques and to promote co-innovation and co-learning, innovators must actively involve farmers in technological development for the development of smallholder agribusinesses among pig farmers.

In terms of adaptation and modification dimensions, the proportion of farmers who were inactive for these two aspects of innovative behavior increased (Fig. 1). This is due to the fact that these two aspects of innovation behavior necessitate a significant amount of labor to modify what is seen or heard to one's preference or to accommodate one's living and working circumstances (Wettasinha et al., 2014). This finding suggests that moving from one aspect of innovation behavior to the next takes work. The labor demand for the pig production business rises as a result of the effort required for a farmer to innovate by effectively progressing from exploration to testing and adaptation to modification. As a result, farmers with small family labor forces must also hire more workers. According to Ndambiri et al. (2012), this suggests that families with larger family labor forces or those with hired labor will probably exhibit more innovative behavior. As a result, initiatives to commercialize smallholder pig farming through innovative farmer behavior ought to increase farmers' ability to recruit and oversee more workers.

CONCLUSION

According to this study, young, educated farmers who have numerous pigs, a smaller household size, are part of a farmer organization, and work outside the farm are more likely to use hired labor than those who don't. The socioeconomic disparities among farmers, which have been shown to influence the labor limitations they encounter, should therefore be taken into account in programs aimed at increasing pig output through the use of hired labor. The proportion of farmers who displayed the various aspects of innovative behavior varied significantly. An expansion of this research will look at the variables that affect pig farmers' innovative behavior.

ACKNOWLEDGEMENT

The authors are grateful to the Mastercard Foundation and Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) for funding research and publication cost through the Transforming African Agricultural Universities to meaningfully contribute to Africa's growth and development (TAGDev) Program.

REFERENCES

Alassaf, A., Majdalwai, M. and Nawash, O. 2011. Factors affecting farmer's decision to continue farm activity in marginal areas of Jordan. *African Journal of Agricultural Research* 6(12): 2755–2760. doi: 10.5897/ AJAR11.481.

Bedemo, A., Getnet, K. and Kassa, B. 2013. Determinants of household demand for and supply of farm labour in rural Ethiopia. *Australian Journal of Labour Economics* 16(3):351–367.

Bragdon, S. H. and Smith, C. 2015. *Small- scale farmer innovation*. Quaker United Nations Office. Geneva: Available at: https://quno.org/resource/2015/12/small-scale-farmer-innovation.

Chopeva, M. A., Nikolov, D. and Yovchevska,P. 2015. Farmers ' adaptation: What factors affecting agricultural innovations? *Proceedings of the 147th European Association of Agricultural Economists (EAAE) Seminar*. Institute of Agricultural Economics, Sofia, Bulgaria. 1:1–13.

Ciaian, P., Falkowski, J. and Kancs, D. 2012. Access to credit,

factor allocation and farm productivity: Evidence from the CEE transition economies. *Agricultural Finance Review* 72(1):22–47. doi: 10.1108/0002146 1211222114.

Èandek-Potokar, M., Nieto, R., Pugliese, C., Araujo, J. P., Charneca, R., Garcia Casco, J. M., Sanchez, G. E., Hernandez-Garcia, F. I., Izquierdo, M., Karolyi. D. and Kušec. G. 2017. Local pig breeds: Nutritional requirements, innovative practices and local feeding resources as challenges in project- TREASURE. *Agriculturae Conspectus Scientificus* 82(2):127–131.

Echebiri, R. N. and Mbanasor, J. A. 2003. Rural age distribution and farm labour supply in crop production systems in Abia State, Nigeria. *Tropical and Subtropical Agroecosystems* 2(1):129–136.

HarvestChoice. 2015. Pig population (head, 2005). International Food Policy Research Institute, Washington, DC and University of Minnesota, St. Paul, MN, USA. http:// harvestchoice.org/data/an05_pig. (Accessed: 5 August 2018).

Ikwap, K., Jacobson, M., Lundeheim, N., Owiny, D.O., Nasinyama, G. W., Fellstrom, C. and Erume, J. 2014. Characterization of pig production in Gulu and Soroti districts in northern and eastern Uganda. *Livestock Research for Rural Development* 26(4):62–79.

Lemessa, S.D., Watabaji, M.D. and Yismaw, M.A. 2018. Climate change adaptation strategies in response to food insecurity: The paradox of improved potato varieties adoption in eastern Ethiopia. *Agriculture & Food Security* 1(1):1–11.

Levin, K.A. 2006. Study design III: Cross- sectional studies. *Evidence based dentistry* 7(1):24–25. doi: 10.1038/sj.ebd.6400375.

Liao, Y. 2017. Innovation capacity and the implementation of eco-innovation: Toward a contingency perspective. *Business Strategy and the Environment* 19(63):1–32. doi: 10.1002/bse.1963.

Moschitz, H. Brunori, G., Roep, D. and Tisenkopfs, T. 2015. Learning and innovation networks for sustainable agriculture: Processes of co-evolution, joint reflection and facilitation. *Journal of Agricultural Education and Extension* 1(1):1–16.

Ndambiri, H. K., Ritho, C. N. and Mbogoh, S. G. 2012. An evaluation of farmers' perceptions and adaptation to the effect of climate change in Kenya. *International Journal of Food and Agricultural Economics* 1(1):75–96.

Ndyomugyenyi, E. K. and Kyasimire, J. 2015. Pig production in Kichwamba Sub-county, Rubirizi district, Uganda. *Livestock Research for Rural Development* 27(10): 1–14.

Nmadu, J.N. and Akinola, A. 2015. Farm labour supply and utilization for food crop production in Nigeria. *Proceedings of the 2nd International Conference on Education and Social Sciences (INTCESS15)*. Instanbul. 1:331–320.

Popadiuk, S. and Vidal, P. G. 2009. Measuring knowledge exploitation and exploration: An empirical application in a technological development center in Brazil. *Proceedings of the XXXIII Encontro da ANPAD*. Sao Paulo. 1:1–16.

Schiederig, T., Tietze, F. and Herstatt, C. 2011. What is green innovation? – A quantitative literature review. *Proceedings of he XXII ISPIM Conference*. Available at: http:// ssrn.com/abstract=1846882.

Sullivan, G.M. and Artino, A.R. 2013. Analyzing and interpreting data from Likert- Type scales. *Journal of Graduate Medical Education* 5(4):541–542. doi: 10.4300/ jgme-5-4-18.

Tambo, J.A. and Wünscher, T. 2014. More than adopters: The welfare impacts of farmer innovation in rural Ghana. *Proceedings of the Agricultural & Applied Economics Association's Annual Meeting 2014*. Minneapolis.

Tatwangire, A. 2014. Uganda smallholder pigs value chain development: Situation analysis and trends. Nairobi, Kenya: International Livestock Research Institute (ILRI).

Tirfe, A.G. 2014. Smallholder farmers' innovation and its determinants: The case of Hirity Mekan Seed Producers' Cooperative , Tigray, Ethiopia. *Developing Country Studies* 4(21):104–115.

Wettasinha, C. Waters-Bayer, A., van Veldhuizen, L., Quiroga, G. and Swaans, K. 2014. Study on impacts of farmer-led research supported by civil society organizations. *CGIAR Research Program on Aquatic Agricultural Systems*. Penang, Malaysia. Working Paper: AAS- 2014-40.

Yamane, T. 1967. Statistics, an introductory analysis, 2nd ed. New York: Harper and Row. 886pp.

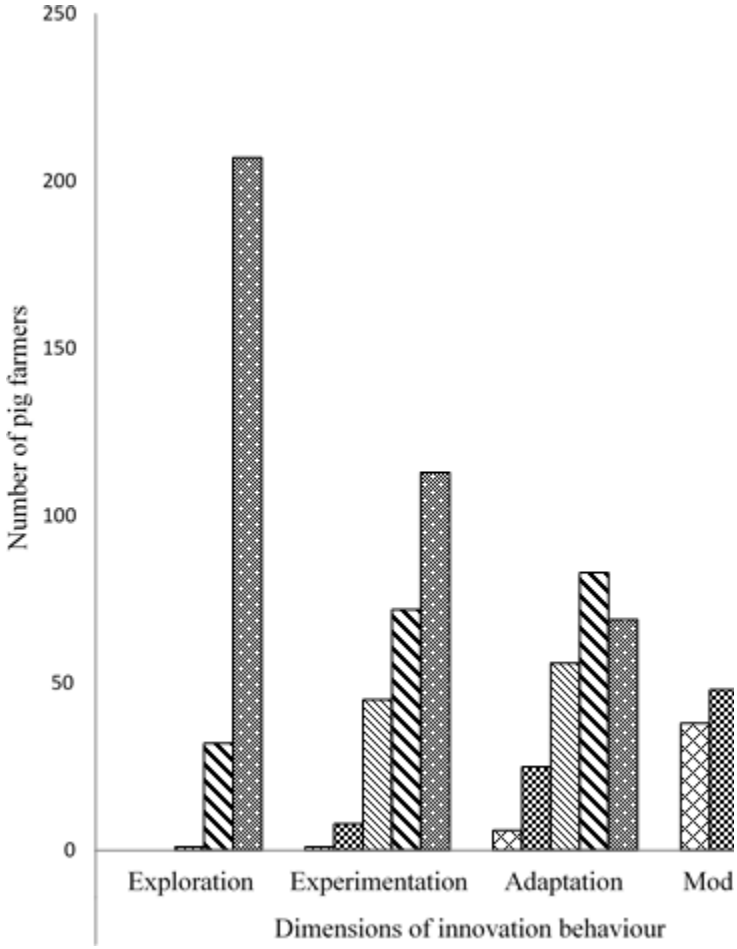

Figure 1. Levels of the dimensions of innovation behaviour among smallholder pig farmers in northern Uganda.