



## Article

# Market Outlet Choice and Its Effects on the Welfare of Smallholder Vegetable and Fruit Producers in Ethiopia

Burhan Ozkan <sup>1,\*</sup> , Ahmed Kasim Dube <sup>1</sup> and Ramu Govindasamy <sup>2</sup>

<sup>1</sup> Department of Agricultural Economics, Faculty of Agriculture, Akdeniz University, Dumlupinar Boulevard, 07058 Antalya, Turkey

<sup>2</sup> Department of Agricultural, Food and Resource Economics, School of Environmental and Biological Sciences, Rutgers-The State University of New Jersey, New Brunswick, NJ 08901-8520, USA

\* Correspondence: bozkan@akdeniz.edu.tr

**Abstract:** The decision to choose an appropriate market outlet may involve a self-selection problem. This suggests that unobservable characteristics play an important role, and the examination of the impact of market outlet choice on smallholder household welfare needs to correct this selection bias. Consequently, this study, by using a multinomial endogenous treatment model, examined the determinants of market outlet choices and their subsequent effects on the welfare of smallholder vegetable and fruit producers in Ethiopia. The results on the determinants of market outlet choices obtained using this model indicated that distance to main roads, livestock ownership, access to extension, and cooperative membership influenced the decisions of smallholder farmers in one way or another. Furthermore, the model results obtained by correcting the selectivity indicated that, relative to formal markets, informal markets have a low impact on the welfare of smallholder farmers. Thus, alternative policy measurements aimed at improving the food security and welfare of smallholder farmers should be accompanied by improving their access to formal markets.

**Keywords:** market outlets; vegetable; fruits; multinomial endogenous treatment model; welfare; Ethiopia



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## 1. Introduction

Smallholder agriculture is the basis of the livelihoods and contributes to the food security of large numbers of people living in poverty [1]. However, due to the subsistence nature of the smallholder agricultural production system, poverty persists among a significant portion of the population living in developing countries, particularly those living in rural areas. This implies that the agricultural production system in developing countries has remained less market-oriented, with a very limited possibility of producers supplying to the market. In this regard, increasing the extent of commercialization among semi-subsistence, low-input, low-productivity smallholder farmers is seen to play a crucial role in poverty alleviation [2]. Thus, focusing on the commercialization of smallholders promises to deliver more equitable rural economic growth than commercialization strategies that focus on large farms. In addition, small farms, typically employing more labor per unit area compared to large farms, and small-farm household expenditure patterns bring greater benefits to local economies [3].

It is thus evident that subsistence production cannot improve rural food security and welfare substantially without improving smallholders' access to markets [4]. However, the identification of ways of increasing the returns to smallholder agriculture through market participation is a research challenge of critical importance. This could be because market participation is both a consequence and a cause of development [5]. In addition, welfare-enhancing, market-based development does not merely result from 'getting prices right'; farm households must also gain the support of institutions and endowments in order to produce a marketable surplus. Accordingly, the important factors underlying the differences in market participation among smallholder farmers include differences in asset

endowments and differences in access to public goods and services. Farmers with access to adequate assets and infrastructures and faced with appropriate incentives would engage actively in markets, while those lacking one or more of those three essential ingredients largely do not [5]. The engagement of smallholders farmers in markets as sellers also depends on the existence of well-functioning markets and efficient infrastructures allowing them to transport their products to market at a reasonable cost [1].

In Ethiopia, the production and marketing of fresh fruits and vegetables, which are high-value and labor-intensive cash crops, contribute significantly to the well-being of the producers. They are important for domestic consumption, export markets, and industrial processing [6]. In the years between 2010 and 2017, Ethiopia's fruit and vegetable exports increased by 8% and 7%, respectively [7]. In addition, according to [8], export revenue from fruits and vegetables reached USD 22.2 million, about 54.4 percent higher than the year 2020, owing to a 12.8 percent increase in price and a 36.9 percent rise in volume. However, the production of these crops is constrained by marketing problems, such as low bargaining power due to lack of alternative market outlets; low prices for produce, especially during the harvesting season; poor infrastructure; poor handling and storage facilities; and lack of marketing information [6]. In this case, smallholders' decisions to choose an appropriate market outlet is an important farm-household-specific decision. However, smallholders' decisions about selling their produce in alternative market outlets are made by evaluating the returns in expected utility for each market outlet [9]. In this regard, when farmers choose among alternative market outlets, there may be self-selection, as farmers choose their marketing outlets based on their perceptions of the returns they will get from each market outlet. This suggests that unobservable characteristics will also play an important role in farmers' decisions about market outlet choice. Hence, the examination of the impact of market outlet choice on smallholder household welfare needs to correct selection bias. In the study reported in [10], the impact of market channel choice on household welfare by maize and pigeon pea smallholder farmers in Tanzania was examined using a multinomial endogenous treatment approach. According to the results of the study, traders in nearby markets and wholesalers in nearby towns had a positive effect on consumption expenditure per capita relative to brokers at the farmgate for both maize and pigeon pea farming households.

However, most of the previous studies on vegetables and fruits failed to consider the selection bias arising from unobservable characteristics [11–13]. The study in [12] examined the determinants of smallholder vegetable producers' decisions about market outlet choice and verified the existence of differences in productivity and income between households among different market outlets in the Lake Tana Basin, Ethiopia. The study used F-statistics to verify the effects of market outlets on productivity and income. However, this descriptive statistics method fails to take into account the selectivity bias arising from unobservable characteristics. Hence, the current study will contribute to the empirical work that is being undertaken by adopting an empirical strategy designed to correct self-selection bias and provide consistent estimates of the welfare impacts of market outlet choices on fruit and vegetable producers in Ethiopia. This will have varied significance for policy measures aimed at improving the food security and welfare of the smallholder farmers in the country.

The rest of the paper is organized into three sections. The next section describes the impact estimation problems, the data, and the variables. The third section presents and discusses the empirical results of the study. Finally, the conclusion and the implications of the results are presented.

## 2. Materials and Methods

### 2.1. Description of the Sampling Procedures and Data

The study used data from the 2018/19 Ethiopian Socioeconomic Survey (ESS), a nationally representative cross-sectional survey of rural households in Ethiopia. The data were collected under the Living Standards Measurement Study—Integrated Surveys on Agriculture Initiative (LSMS-ISA) in collaboration with the Central Statistical Authority

(CSA). In the collection of these data, a two-stage probability sampling technique was used. As the study concerns rural farmers in Ethiopia, by excluding the capital and the provincial capital cities and deleting some missing observations, the analysis here was based on a sample of 608 households. The survey questionnaire from the ESS also collected information on the socio-economic, farming, and institutional characteristics of the households.

## 2.2. Method of DATA Analysis

### Conceptual Framework and Model Specification

In the current study, producers' market outlet choices were modeled based on the random utility model (RUM). RUM is an indirect utility function: an individual with specific characteristics associates an average utility level with each alternative market outlet choice in a choice set. In this way, a producer's decision to sell in a given market is derived from the maximization of utility expected from these markets [14]. In this case, producers choose the appropriate market by comparing the expected utilities of the market outlets. Though the utility cannot be observed, the choice made by the producers reveals the choice that provides the producers the greater utility [15]. The probability that a producer chooses alternative  $j$  can be explained by a multinomial model [15] as:

$$P_{ij} = \frac{\exp(Z_i \alpha_j)}{\sum_{k=1}^j \exp(Z_i \alpha_k)} \quad (1)$$

However, the producer's choice of a market will also involve self-selection. Consequently, impact analysis of market outlet choice must include the latent factors that incorporate unobserved characteristics of producers [16]. This process allows for the correction of self-selection and consistent estimates of the impact of market outlet choice on the welfare of producers. Hence, the multinomial endogenous treatment approach proposed by the authors of [16,17] was adopted for this study. This method jointly estimates market outlet choices and an outcome equation simultaneously. The probabilities of market outlet choices following a mixed multinomial distribution can be specified as follows:

$$pr(s_i / Z_i, l_{ij}) = \frac{\exp(Z_i \alpha_j + \delta_j l_{ij})}{1 + \sum_{k=1}^j \exp(Z_i \alpha_k + \delta_k l_{ik})} \quad (2)$$

where  $Z_i$  represents pre-determined socio-economic characteristics of the  $i$ th producer and a latent factor  $l_{ij}$  incorporating unobserved characteristics common to the individual  $i$ 's treatment choice and outcome.  $\alpha_j$  and  $\delta_j$  are factor loading parameters representing the observed and unobserved individual heterogeneity affecting the utility of selling in a given market outlet, respectively.

The expected value of the outcome equation for individual  $i$  can be formulated as:

$$E(y_i / s_i, x_i, l_{ij}) = x_i \beta + \sum_{j=1}^j \gamma_i s_{ij} + \sum_{j=1}^j \lambda_j l_{ij} \quad (3)$$

where  $E(s_i, x_i, l_{ij})$  is a function of  $x_i$  representing vector covariates with an associated parameter vector of  $\beta$  and  $s_i$  denotes a set of dummies representing market outlet choices relative to the control groups, with the associated parameters  $\gamma_i$  denoting the treatment effect relative to the control and  $l_{ij}$  the latent factors representing the effect of unobservable characteristics both on the outcome and the selection into treatment. The factor loading parameter  $\lambda_j$  represents the correlation between treatment and outcomes through unobservable characteristics. According to [16,17], due to the non-linear functional forms of the multinomial equation, the joint estimation of the parameters for the market outlet choice and its subsequent welfare impact is possible in principle, though the variables appearing in both equations are similar. Consequently, the joint estimation of these models

was carried out using maximum simulated likelihood based on Halton sequences, using the Stata 14 command 'mtreatreg' [16].

### 2.3. Definition of Variables and Working Hypothesis

#### 2.3.1. Outcome Variable

Consumption expenditure was used as an indicator of welfare [18]. The consumption expenditure data were based on food (household consumption of home-produced food + purchased food + aid or gift food) and non-food expenditure collected during the survey period. However, from consumption expenditure data, per capita consumption expenditure was constructed by adjusting the summation of the food consumption expenditure and non-food consumption expenditure per month and used as a proxy measure of household welfare.

#### 2.3.2. Dependent Variables

In the multinomial treatment regression model, market outlet choice was used as the dependent variable of the selection model.

#### 2.3.3. Independent Variables and Hypothesis of the Study

As there are various factors that affect producers' choices of market outlets, selecting an appropriate market outlet for the delivery of farm products is not an easy task [13]. In this regard, important variables of interest were selected based on the theoretical and empirical studies conducted to identify determinants and welfare effects of market outlet choices. The demographic characteristics of producers, including family size [19], age [20], marital status, gender [20], and educational level [21] of the household head measured in years of schooling of the farmer, were hypothesized to influence the choices of market outlets in one or another way. Socio-economic characteristics of the producers were also expected to influence market outlet choices. These include the total number of livestock owned, access to credit, and off-farm income opportunities. Producers' access to extension services as a proxy for marketing information and the physical distance of producers from main roads and markets [14] were also considered important determinants of market outlet choice. Membership of a producers' cooperative was also included in the model to capture the influence of the bargaining power of farmer groups on the selection decision about market outlets [22].

## 3. Results and Discussion

### 3.1. Market Outlet Choices

According to Table 1, most households (59 percent) chose the main market as their market outlet, while 3 and 36 percent of the producers had selected roadsides and local markets as their market outlets for their vegetables and fruits. Few producers sold their products to friends (2.14 percent) and agricultural cooperatives (0.66 percent).

**Table 1.** The main market outlet choices.

Market Outlets	Frequency	Percent
Friends and relatives	13	2.14
Local market	218	35.86
Main market	355	58.39
Agricultural cooperatives	4	0.66
Roadside	18	2.96
Total	608	100.00

Source: Authors' computations from the Ethiopian socio-economic sample survey (2018/2019).

### 3.2. Descriptive Statistics

The descriptive statistics are presented in Table 2. According to these results, most of the surveyed households (86 percent) were headed by male households. The average age of the surveyed household head was 46 years old. The results for marital status indicated that most of the households that selected the various market outlets were married households. Relatively, the highest educational level in years was achieved by households that selected local market outlets. The highest average household size was found among the producers selling their produce at agricultural cooperatives. The average household size was 5 persons per household for the households who selected the local and main markets as their marketing outlets.

**Table 2.** Descriptive statistics.

Variables	Friends and Relatives	Local Market	Main Market	Agricultural Cooperatives	Roadsides	Total
	Mean (Std. Err.)	Mean (Std. Err.)	Mean (Std. Err.)	Mean (Std. Err.)	Mean (Std. Err.)	Mean (Std. Err.)
Gender	0.62 (0.51)	0.89 (0.32)	0.85 (0.36)	0.75 (0.5)	0.89 (0.32)	0.86 (0.35)
Age	47.31 (18.73)	45.78 (14.29)	46.18 (14.89)	43 (16.51)	42.39 (14.10)	45.92 (14.71)
Marital status	0.62 (0.21)	0.85 (0.36)	0.81 (0.39)	0.75 (0.24)	0.89 (0.25)	0.82 (0.38)
Educational level	1.41 (4.57)	2.20 (5.16)	1.71 (4.56)	1.31 (3.57)	1.21 (2.36)	1.88 (4.73)
Household size	3.69 (2.14)	5.13 (2.03)	4.99 (2.20)	6.25 (2.36)	5.11 (2.19)	5.02 (2.15)
Extension access	0.62 (0.51)	0.41 (0.49)	0.44 (0.50)	0.16 (0.50)	0.17 (0.38)	0.42 (0.49)
Credit access	0.08 (0.28)	0.10 (0.30)	0.08 (0.27)	0.02 (0.10)	0.11 (0.32)	0.08 (0.28)
Livestock (TLU)	2.09 (2.66)	3.91 (3.26)	3.06 (3.19)	3 (2.74)	2.09 (4.95)	3.31 (3.29)
Access to non-farm income	00.08 (0.28)	0.06 (0.24)	0.05 (0.22)	0.01 (0.12)	0.11 (0.32)	0.061 (0.23)
Mobile phone	0.46 (0.52)	0.34 (0.47)	0.34 (0.51)	0.45 (0.51)	0.5 (0.51)	0.34 (0.50)
Distance roads	2.54 (41.52)	17.78 (21.02)	27.38 (26.86)	11.75 (9.39)	21.44 (20.77)	24.19 (25.7)
Distance major town	26.46 (9.09)	15.47 (15.90)	19.87 (17.93)	15.5 (12.15)	19.72 (15.55)	18.40 (17.28)
Distance administration town	59.31 (77.04)	50.69 (46.07)	53.740 (55.79)	62.25 (92.04)	28.44 (26.93)	52.07 (52.67)
Cooperative access	0.15 (0.38)	0.12 (0.32)	0.09 (0.28)	0.23 (0.21)	0.22 (0.43)	0.10 (0.30)

Source: Authors' computations from the Ethiopian socio-economic sample survey (2018/2019).

Access to extension contact, capturing the role of supplying the necessary marketing information, accounted for about 44 percent of households choosing the main market outlet. The ownership of livestock could affect the selection of market outlets by providing transport for the households to move their products. However, the average number of livestock owned was low, about 3.31 in Tropical Livestock Units (TLU). Hence, in rural areas, where households are characterized by a low asset base, access to credit is expected to increase the access of households to markets. Producers' access to non-farm income opportunities was also very low (6 percent).

Mobile phone ownership, capturing household access to marketing information, accounted for about 34 percent of the households selling their products in the local and main markets. The average distance from the main road of households selling their products at the roadsides was 21 km. Further, the average distance to the major town was also higher for households selling their products to their friends and relatives. Cooperatives, by

providing marketing information to members or selling on behalf of members, can improve market participation among smallholder farmers.

### 3.3. Determinants of Market Outlet Choices

According to the results presented in Table 3, distance from main roads influenced the decisions of the producers selling in all market outlets. The effect was significant for the producers who chose roadsides relative to the main market as the market outlet for the sale of their vegetable and fruit products. This indicated that as the distance of a household from the main road increases, the likelihood of selling produce at the roadsides increases. Producers prefer selling at roadside stands to minimize the transportation costs associated with travelling long distances. However, in the case of the local market, the likelihood of choosing this market outlet decreases as the distance from the main road increases.

**Table 3.** Determinants of market outlet choice: mixed multinomial logit model.

Variables	Consumer vs. Main Market	Local Market vs. Main Market	Agricultural Cooperatives vs. Main Market	Roadside vs. Main Market
	Coef. (Std. Err.)	Coef. (Std. Err.)	Coef. (Std. Err.)	Coef. (Std. Err.)
Gender	−1.18 (1.01)	0.33 (0.40)	1.85 (3.73)	−0.60 (1.02)
Age	0.01 (0.03)	−0.01 (0.01)	−0.05 (0.05)	0.003 (0.02)
Marital status	0.15 (0.29)	−0.02 (0.13)	0.73 (0.99)	−0.64 (0.49)
Education level	−0.08 (0.09)	0.03 (0.02)	−0.10 (0.31)	0.02 (0.05)
Household size	−0.23 (0.19)	−0.02 (0.06)	0.52 (0.33)	0.08 (0.14)
Extension access	0.78 (0.68)	−0.32 (0.23)	−43.62 (105.00)	−1.60 ** (0.74)
Access to credit	−1.28 (1.69)	0.22 (0.40)	−40.51 (237.00)	1.50 (1.01)
Livestock (TLU)	−0.033 (0.14)	0.11 *** (0.04)	−0.01 (0.239)	−0.15 (0.13)
Farm size	0.73 (0.72)	0.43 (0.34)	0.74 (0.10)	0.54 (0.59)
Access to non-farm income	0.94 (1.23)	0.16 (0.46)	−42.26 (282.00)	0.85 (0.95)
Mobile phone own	0.74 (0.67)	−0.17 (0.23)	−43.47 (138.00)	0.31 (0.55)
Distance to main roads	0.03 ** (0.01)	−0.02 *** (0.01)	−0.04 (0.04)	−0.01 (0.01)
Distance major town	−0.01 (0.01)	0.003 (0.002)	0.01 (0.01)	−0.03 * (0.01)
Distance administration town	0.02 (0.02)	0.54 (0.36)	−0.03 (0.04)	0.03 (0.02)
Cooperative membership	0.64 (1.18)	−0.02 *** (0.01)	−41.01 (31.00)	1.53 ** (0.75)
Constant	−4.50 ** (1.94)	−0.13 (0.76)	−7.06 (6.24)	−1.13 (1.89)
Log likelihood	−7310.12			
No. of observations	599			
Wald chi2 (73)	204.52			
Probability > chi2	0.00			

Notes: Main market is the base category; \*\*\*, \*\*, and \* represent 1, 5, and 10 percent significance levels, respectively.

Livestock holding influenced the choice of the local market relative to the main market positively and significantly. This could be because an increment in the herd size requires more labor, making the local market more accessible. As expected, the influence of the access to extension services variable was negative and significantly influenced decisions to choose roadsides relative to the main market outlet. This because extension services provide producers with the required technical assistance and marketing information and

can link producers to markets [23], which in turn increases the likelihood of producers choosing the main market outlet. The results corroborate the findings of [24].

Cooperative membership influenced the decisions of producers to choose the local market negatively and significantly. In this case, the possible reason could be that the producer cooperatives, by providing farmers with the advantage of bulking and hence gaining economies of scale [25], could help producers generate higher incomes, just like the main market outlets [22]. In this regard, cooperatives have the potential to lower costs [22]. Furthermore, organized producers have higher bargaining power [22]. Similar results were also obtained by other researchers [24,25] who suggested strengthening collective action through well-organized farmer groups.

#### 3.4. The Impact of Market Outlet Choices on the Welfare of Smallholder Producers

The selectivity-corrected impacts of market outlet choice on per capita consumption expenditure obtained from the joint estimation of Equations (1) and (2) are presented in Table 4. According to these results (Table 4), the coefficient of the latent factor,  $\lambda$ , for the local market outlet was significantly negative, implying that producers who are more likely to choose the local market relative to the main market, based on the unobserved characteristics, have lower consumption expenditures, indicating lower welfare outcomes. In the case of the other market outlets, including friends and relatives and agricultural cooperatives, the coefficient of the latent factor,  $\lambda$ , was statistically significant and positive, indicating that producers who are more likely to choose these market outlets, based on their unobserved characteristics, relative to the main market outlet, have higher per capita consumption (i.e., higher welfare). This could be because the producer cooperatives have the potential to achieve economies of scale by which they lower costs and facilitate the processing and marketing of agricultural commodities for individual producers. In addition, producers, through cooperative institutions, will have more bargaining power than individuals working alone and are better equipped to negotiate with other more powerful market players to ultimately increase profits [22]. In this regard, building producer organizations is an important effort through which the welfare of producers can be improved.

However, the results presented in Table 4 indicated that, after controlling for selection bias based on unobservable characteristics, there was a significant positive impact on per capita consumption expenditure (i.e., welfare) of supplying only to local markets relative to the main market. In the case of the other market outlet choices, which can be considered as informal market outlets (friends and relatives and roadsides), there was no significant impact on the welfare of the producers relative to the main market. This suggests that formal market outlets are far better than informal market outlets in terms of impacting the welfare of producers. Similar results were also presented in [10]. In the case of the agricultural cooperatives, the impact on the welfare of smaller households was insignificant. This could be because cooperatives were not playing their role of helping their members facilitate the processing and marketing of agricultural commodities. In other words, the existing agricultural cooperatives may not be market-oriented. Hence, although the impact of agricultural cooperatives on the welfare of producers was found to be insignificant in this study, increasing the market orientation of agricultural cooperatives will have important policy implications. This is because cooperation through its variety of tasks can help producers increase their gains from participation in markets, especially in the case of vegetables and fruits, which are easily perishable.

Table 4 also shows the determinants of the welfare of smallholder farmers. Accordingly, the age of the household head, household size, distance to the administration center, and cooperative membership were found to have significant effects on the welfare of producers. In this case, older households usually tend to have more resources at their disposal, which they have developed over a long period of time. Increasing their capacity to produce marketable surplus enhances the welfare of households participating in the market. Producer cooperatives also helps smallholder farmers process and market their products

more effectively to generate higher incomes [22]. Similarly, a large household size implies the availability of cheaper labor, which can increase the possibility of producing marketable surplus, which in turn increases the welfare of farming households participating in the market [26].

**Table 4.** The welfare effects of market outlet choices: selectivity corrected.

Variables	Coef.	Std. Err.
Market channel choice		
Friends and relatives	0.10	0.23
Local market	0.35 ***	0.13
Agricultural cooperatives	−0.06	0.37
Roadsides	0.16	0.21
Socio-economic and farming characteristics		
Gender	0.11	0.12
Age	0.004 *	0.002
Marital status	−0.02	0.04
Education level	−0.003	0.006
Household size	0.11 ***	0.02
Extension access	0.09	0.06
Access to credit access	−0.08	0.11
Livestock ownership (TLU)	−0.001	0.01
Farm size	0.03	0.05
Access to non-farm income	−0.11	0.13
Distance roads	−0.002	0.001
Distance major town	0.001	0.001
Distance administration town	−0.004 **	0.002
Cooperative membership	0.18 *	0.10
Constants	9.525	0.21
Ln alpha	−1.37 ***	0.13
Lambda <sub>Friends and relatives</sub>	0.22 *	0.12
Lambda <sub>Local market</sub>	−0.32 **	0.13
Lambda <sub>Agricultural cooperatives</sub>	0.32 ***	0.10
Lambda <sub>Roadsides</sub>	−0.03	0.12
Alpha	0.25	0.03

Notes: Dependent variables are log consumption expenditures; main market is the base category; \*\*\*, \*\*, and \* represent 1, 5, and 10 percent significance levels, respectively.

#### 4. Conclusions

In Ethiopia, the production and marketing of fresh fruits and vegetables, which are high-value and labor-intensive cash crops, can contribute significantly to the well-being of producers. However, constraints associated with marketing problems, such as low bargaining power due to lack of alternative market outlets, entail limited welfare gains. Thus, smallholders' choices of appropriate market outlets are important farm-household-specific decisions and the accessibility of market outlets plays an important role in influencing producers' decisions to choose and participate in alternative market outlets. In this regard, when farmers choose among alternative market outlets, there may be self-selection, as farmers choose their marketing outlets based on their perceptions of

the returns they will get from each market outlet. Hence, the current study, by adopting the multinomial endogenous treatment approach, examined both the determinants of market outlet choices and the subsequent effects on the welfare of smallholder farmers in Ethiopia. The results of the determinants of market outlet choices indicated that distance to main roads, livestock ownership, access to extension, and cooperative membership have influenced smallholder farmers' market outlet choices in one way or another. These results implied that increasing the access of smallholder farmers to main markets requires, on the one hand, building the asset bases of households and, on the other hand, increasing access to extension to help them obtain the appropriate market information that is required for them to market their products in the appropriate market outlets. Furthermore, improving market infrastructures by building marketplaces and constructing and improving roads to reduce transportation costs should be an important consideration in promoting appropriate market outlet choices among farmers. However, the gain accruing to smallholder farmers could be heavily influenced by their bargaining power. Individually, they would not be able to bargain with larger firms, which necessitates the building and improvement of farmers' organizations in rural areas. Emphasis should therefore be given to building and improving the performance of agricultural cooperatives, which could help the members through the processing and marketing of agricultural products. The results on the effects of market outlet choices also indicated that, relative to main markets, informal markets have low impacts on the welfare of smallholder farmers. This implied that improving the welfare gains of smallholder farmers through their market participation and market outlet choices requires improving their access to main markets. Hence, policy measures aimed at improving the welfare of smallholder rural households should increase the inclusion of smallholder farmers in more profitable market outlets.

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