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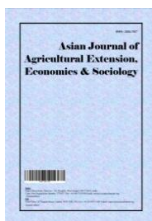
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Evaluating Market Structures and Credit Services for Small Scale Almond Producers in the Samangan and Balkh Provinces, Afghanistan

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Authors' contributions

This study was carried out with the collaboration of both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The objectives of the study were to investigate market price structure, market information systems, and credit services for smallholder almond producers around the Samangan and Balkh provinces of Afghanistan. A sample of 125 almond producers were the participants of the study. The primary tool for data collection was a questionnaire conducted by face to face interviews, and the secondary data of the survey collected from various sources, (CSO, FAO reports, government publications, USAID reports, NGOs reports, journals, and websites). Data were analyzed using parametric and nonparametric statistical methods. Results of the study showed that there were significant fluctuations in the average price of different almond varieties between 2014 and 2018 period. Exporters and local traders have the most influence on price determination. According to the study on the market information; 41.6% of producers acquired market information regularly, and 58.4% of them did not receive market information regularly. The research concludes that Afghanistan has a high potential and many opportunities to produce good quality of almond not only for domestic use but also for export to neighbors and more distant countries. This will help the country to take steps towards sustainable horticulture and the improvement of a viable economy.

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1. INTRODUCTION

Agriculture is the most significant sector for developing countries as it provides basic necessities for the increasing population, employment opportunities for rural people, and contributes to national income and exports. Agriculture also provides labor and raw materials for the industrial sector; and creates demand for the inputs produced by different industries, such as chemicals and farm machinery [1,2]. Being a developing country, Afghanistan's nutrition and economic development is highly depended on agricultural sector [3,4,5]. The majority of the population lives in rural areas, where poverty and deprivation are the most severe. Almost all rural households depend directly or indirectly on agriculture and given the sectors large contribution to the global economy, agriculture can be expected to be a key element of growth and development [6].

Afghanistan has a unique climate that provides perfect agro-climatic and bio-diversity, which is ideal for growing a variety of agricultural crops, including a large number of horticulture crops especially almond [7]. Horticulture in Afghanistan has gained its credibility for providing sustainable income, food security, and employment opportunities, both in rural and urban areas [8]. Almond is one of the broadest cultivation fruit crops of the world in varying climatic zones extending from the temperate to the tropics in Samangan and Balkh region of Northern Afghanistan [9]. Almond farming is limited to the irrigated lands adjacent to rivers in Afghanistan. Growing in fertile valleys, the almond orchards extend form green ribbon through the dry landscape of Afghanistan. Although the irrigated area is precious in the country, there are over 12000 hectares of almond orchards. Most of the farmers cultivate about half hectare of land and work in with their families.

The Afghanistan almonds command strong market demand for both domestic and export. As a result, Afghanistan now is focusing on increasing almond production in terms of quantity and quality [10]. Almonds are an essential category among dried fruits and nuts produced in Afghanistan. Production and exports have thrived during the last decade. They account for a significant share of the export market of dried fruits and nuts, with the largest quantities being

consumed in the domestic market [11]. The global nut market has shown significant development in the last decade; however, the increases in other agricultural products are meager.

Nuts have been cultivated in the Mediterranean countries, and they are of great economic importance [12]. They have been traditionally consumed in all Mediterranean countries as a component of the typical Mediterranean diet, but are also imported by Europe [13]. Almond ranks as 11th in nut production of Afghanistan. Almond production has not reached the expected levels as compared to the other Mediterranean countries [14]. The Afghanistan almond is a large and dynamic part of agriculture and makes significant contributions to the economy. Almond production and its value have grown rapidly, and the industry has consisted of a large share in the agricultural sector. The economic contribution of almond in the agricultural sector has also grown in recent years. Afghanistan almonds are especially important in international trade [15]. It is famous and demanded by outside markets, found useful by major consumers, and has high market opportunities for new as well as established market players. It is an important category among dried fruits and nuts produced in Afghanistan. Production and exports have grown vigorously during the last decade. They account for a significant share of the export market of dried fruits and nuts, with the largest quantities being consumed in the domestic market [16].

2. MATERIALS AND METHODS

The investigation of market price assessment, market information systems, and credit services for smallholder almond farmers in the Samangan and Balkh provinces was conducted in December 2018, for which 125 almond orchard players were interviewed. The primary tool for data collection was a questionnaire conducted by face to face interviews, and the secondary data of the study were collected from various sources, (CSO, FAO reports, government publications, USAID reports, NGOs reports, journals, and websites). The collected data were analyzed using parametric and nonparametric statistical methods. This survey was based on the primary data collected through a stratified random sampling method, according to the almond orchard association, nursery association, and

dried fruit seller association lists in the study area. Stratified sampling determination formula of Yamane (2001) with 0.05 mean errors and 0.05 Alpha level was used to draw an accurate sample size. This number was proportionally divided into three strata, and respondents in each stratum were randomly selected. Each respondent had an equal and independent chance of being included in the sample. This sample size determination method was similarly used by [17,18,19,20,21]. The formula for the sample size was:

$$n = \frac{N \sum N_h S_h^2}{N^2 D^2 + \sum N_h S_h^2}, \quad D^2 = \frac{e^2}{t^2}$$

Where:

n = Sample size
N = Accessible population
N_h = Size of each stratum
S_h = Standard deviation within a stratum
D² = Desired variance
e = Accepted error from the mean (5%)
t = t-value from the accepted confidence interval (5%)

The data collection questionnaire included questions about the status of almond price for the past five years, intermediaries influence the price of almond in the market, credit services, reasons for producers not having access to credit, credit range, interest rates, source of credit services, purpose of using credit, precondition of using credit, marketing information, quality of market information, frequent of extension visits, and source of market information. Earlier work conducted in this area and socioeconomic characteristics of farming of the region were taken into consideration in preparation of the questionnaire. Technically it was included both open and closed ended questions.

Descriptive statistics including means, frequency, percentages, standard deviation, minimum, maximum, and ANOVA (F test) approach were used for data analyses. Formula for ANOVA is given below:

$$F = \frac{MST}{MSE}$$

Where,

F=ANOV as Coefficient
MST = Mean sum of squares due to treatment
MSE = Mean sum of squares due to error.

The price index is a relative indexes average, meaning there is a base year. The base years are a standard to which all other years are set. "Most price index series have a 2014 -2018=100 reference base. The indexes average level (representing the indexes average price level) for the five year period a 2014 -2018 equal to 100; then measures changes in relation in the below Table 2 [13].

$$I = \frac{X_i}{X_0} * 100$$

Where,

I = Indexes Average level
X₀ = Average price of reference base year
X_i = Average price of measures year

The index is calculated by taking the average indexes price of the almond in one year and dividing it by the price of the almond in another year. This ratio is then multiplied by 100. The base year is always 100.

3. RESULTS AND DISCUSSION

3.1 Market Structure of Almond

In this section of the study, recent experiences of farmers with almond prices in the locality, trends of almond prices for the period of 2014-2018, and intermediaries influencing almond prices in the region were examined. Farmer's experiences with almond prices for the past five years have been presented in Table 1. Results showed that 46.4% of producers reported that almond prices have an increasing trend while 24.8% reported a decreasing and 28.8% stable price for last five years. This finding indicated that close to half of the respondents experienced an increasing trend in almond prices. Since higher prices for producers indicated higher income but this increase should be higher than the increases in production costs.

Table 1. Farmers experience with almond prices for the past five years

Variables	Frequency	%
Increasing	58	46.4
Decreasing	31	24.8
Stable	36	28.8
Total	125	100

Table 2 showed the prices of different almond varieties for the 2014-2018 periods. The variety of Satar Bayee was the most market desirable

product and had the highest price, due to the taste and easiness to break its shell with hands. Its shell is delicate like peanut. The average price of Satar Bayee in 2018 was 519.4 Afghani per Kg. Because the variety of Sangak (stone) was not very much desirable due to the hard break of its shell with hands, the price was low (106.66 Afghani per Kg). According Table 2 the average price of all different almond varieties fluctuated in the 2014-2018 periods. The results of one way ANOVA test showed that the average price of almond was significantly different in these years. As it can be followed from the Table 2 there was an increase from 2014 through 2016 but a decrease in 2017, and again an increase in 2018. The estimated indices for the average almond price for the 2014–2018 periods also showed similar trend. These results indicated that Afghani almond producers face fluctuating prices in the market which makes it difficult for them to have a stable income.

In terms of the influence that intermediaries have on almond prices in the market, exporters (49.6%), local traders (30.4%), producers (15.2%), negotiation of farmers with traders (3.2%), and association/cooperatives (1.6%) were influential, respectively. This result indicated that almond prices in the market were determined by market forces other than farmers. Farmers have minimal influence on prices. Results regarding this variable are presented in Table 3.

3.2 Credit Services

Almond producers may use credit to purchase related inputs or to take care of farm activities without any delay. Those who use credit from formal financial institutions may intend to make new investments in horticultural sector. The findings showed that the majority of almond producers (80.8%) did not use credit while 19.2% vice versa. These figures indicated that credit use among the Afghani almond producers was quite low.

According to the survey, the most important reason for farmers not using credit was because they found the interest payment for credit against to their religion (43.57%). This was followed by no need for credit (20.79%), high-interest rates (16.83%), fear of inability to repay (12.87%), and lack of credit services (5.94%), respectively.

The producers received credit services from various sources, and the interest rate was quite

different. As shown in Table 4, 70.9% of producers paid 10% interest rate while 20.8% paid 12% interest rate and 8.3% paid 15% interest rate to credit providers.

According to the study, smallholder producers received credit service from different sources such as Banks, microfinance institutions, NGOs, and relatives. According to Table 4, 29.17% of producers got credit from Banks, 45.83% of producers from microfinance institutions (BARAK, Agriculture Cooperative), 8.33% of producers provide from NGOs, and 16.67% of producers provide from relatives.

The purpose use of credit, such as purchasing farm inputs, Livestock, and HH consumption. As table 4 showing the 37.5% of producers used for the purchasing farm inputs, 58.3% of producers used or the purchasing livestock, and 4.2% of producers used for the household consumption.

The precondition for getting credit was a personal guarantee, landholding, collateral, membership, and partial payment. As Table 4 shows that 16.67% of producers' present personal guarantee, 29.17% of producers' presents' landholding, 45.83% of producers present collateral, and 8.33% of producers present others condition, as shown in Table 4.

3.3 Marketing Information

The farmers have to decide what to plant when to plant, and where to sell their products. These decisions were not very complicated in the past. They have often made these decisions considering the decisions of their neighbors or relatives. However, the situation is changing, as many farmers now need to be market-oriented and make individual decisions considering market needs. Accordingly, they decide on marketing strategies and timelines to achieve the highest profit margins. Farmers can use market information to decide whether it is worth to sell their product in the market or to store some of it for several months for potential price increases in the future [22]. According to the study on the market information; 41.6% of producers getting market information regularly, and 58.4% of producers did not receive any market information regularly.

Farmers' contacts with extension personnel enable them to receive updated information about farming techniques, input provision, and marketing strategies. Relating this subject,

Table 2. The trend of almond prices in 2014-2018 period

Variety of Almond	Average Price Almond Per Kg/Afs 2014-2018				
	2014	2015	2016	2017	2018
Satar Bayee (Satar Bayi)	506.69	526.97	545.71	492.97	519.4
Shokar Bayee (Shukar Bayi)	232.65	240.12	246.72	237.37	255.88
Qambari (Ghambari)	281.77	296.51	301.96	285.06	309
Khairuddini (Khairuladini)	255.26	260.17	261.67	253.09	257.31
Qahar Bayee (Gharhar Bayi)	240.50	269.00	289.33	261.83	299.86
Murawaji (Moravaja)	146.94	154.38	162.13	149.86	165.6
Qari bayee	183.75	193.88	224.25	224.88	263.27
Abdul Wahedi	244.00	251.14	289.86	253.00	283.71
Majidi	257.14	289.71	258.14	238.71	193.78
Sangak (Sanghak)	106.88	105.06	108.24	102.00	106.66
Kaghazi (Khaghazi)	257.14	269.43	310.14	287.86	293
Others	264.82	290.27	290.82	277.36	346.5
Average	290.39	302.82	312.53	290.27	298.08
Indexes Average	100.0	100.3	105	98.4	105.9
F-test (P-value)	97.154 (0.000)	105.514 (0.000)	127.341 (0.000)	209.379 (0.000)	296.845 (0.000)

Table 3. Intermediaries influence on the price of almond in the market

Variables	Frequency	%
Association/cooperatives	2	1.6
Local traders	38	30.4
Exporters	62	49.6
Producers	19	15.2
Negotiation of farmers with traders	4	3.2
Total	125	100.0

respondents were asked their frequency of meeting with extension personnel serving in the study area. As shown in Table 5 more than half of the farmers (58.4%) had no contacts with agricultural extension personnel. Of the total farmers 18.4% had monthly contacts, 1.6% weekly contacts, and 1.6% daily contacts, respectively.

Farmers were asked whether they are satisfied with the quality of market information they receive from different sources. According to Table 5 the majority of respondents (65.6%) remained neutral with the quality of market information while 21.6% were unfavorable and 12.1% were favorable.

Market information is the function of providing scientific research and new knowledge to producers through personal/professional networks tools (trader, friends/neighbor, development agent, ngos, university), and public information system (market bulletins, radio, television, message blackboards at market places) with the objective of improving their

production, income, and (implicitly) life quality. As result of analysis of Table 6 shows that the producers who have been getting market information from traders are 20%, friends/neighbors 76.8%, development agent 10.4%, Agriculture department 59.2%, ngos 66.4%, university 27.2%, market bulletins 53.6%, radio 55.2%, television 50.4%, and message blackboards at market places 29.6% in the study area. Earlier studies in this field resulted that maize farmers in Kahramanmaraş province of Turkey acquire more information from traditional sources (i.e., other farmers and own family members) in comparison to information acquired from the agricultural extension service. In the same study early adopters of maize are more aware of extension programs, and they also used extension services more than late adopters [2]. In another study conducted in Kumluca district of Antalya province [23], the most important information sources of greenhouse tomato growers were farmers' own experiences, and the technical personnel they employed in their business.

Table 4. Credit Services Status

Variables	Frequency	%	Variables	Frequency	%
Access to credit services			% of Interest Rate		
Yes	24	19.2	10	17	70.9
No	101	80.8	12	5	20.8
Total	125	100	15	2	8.3
Reasons for producers not using credit			Total	24	100
High-interest rate	17	16.83	Source of credit service		
No need	21	20.79	Banks (The First Microfinance Bank Afghanistan)	7	29.17
Fear of inability to repay	13	12.87	Microfinance institutions (BARAK, Agriculture Cooperative)	11	45.83
No service	6	5.94	NGOs	2	8.33
It is against religion	44	43.57	Others (Relative)	4	16.67
Total	101	100	Total	24	100
Purpose of credit use			Precondition of credit		
Purchasing farm inputs	9	37.5	Personal guarantee	4	16.67
Purchasing livestock	14	58.3	Landholding	7	29.17
HH consumption	1	4.2	Collateral	11	45.83
Total	24	100	Others	2	8.33
			Total	24	100

Table 5. Marketing Information Status

Variables	Frequency	%	Variables	Frequency	%
Receiving market information regularly			Frequency of farmers visit to extension services		
Yes	52	41.6	Daily	2	1.6
No	73	58.4	Weekly	20	16
TOTAL	125	100	Monthly	7	5.6
Rate quality of market information			Rarely	23	18.4
Favorable	16	12.8	Never	73	58.4
Neutral	82	65.6	Total	125	100
Unfavorable	27	21.6			
Total	125	100			

Table 6. Sources of market information

Variables	Frequency	%
Traders	Yes 25	20
	No 100	80
Friends/neighbor	Yes 96	76.8
	No 29	23.2
Development Agent	Yes 13	10.4
	No 112	89.6
Agriculture department	Yes 74	59.2
	No 51	40.8
NGOs	Yes 83	66.4
	No 42	33.6
University	Yes 34	27.2
	No 91	72.8
Market bulletins	Yes 67	53.6
	No 58	46.4
Radio	Yes 69	55.2
	No 56	44.8
Television	Yes 62	49.6
	No 63	50.4
Message blackboards at market places	Yes 37	29.6
	No 88	70.4

4. CONCLUSION

Price important to marketers because it represents marketers' assessment of the value customers see in the product or service and are willing to pay for a product or service [24]. The economic theory contends that the market price converges at a point where the forces of supply and demand meet. Price increases for agricultural products indicate that farmers may increase their income and wellbeing, however; input prices should remain constant or increase with a lower rate than product prices. The result of the study showed that the 46.4% of producers responding to increasing, 24.8% of producers responding to decreasing, and 28.8% of producers responding to the stable almond price in the last five years. These figures may imply an income rise but since we did not have any information about the input prices within the same period, any conclusion connecting the product prices with income and welfare may be misleading.

Access to credit services and using long term loans for investments is an important factor for almond producers. Using short term credit may help farmers to purchase related inputs and make payments for off farm labor they hire. Long term loans, on the other hand may provide farmers to purchase more land and increase farm size, to purchase new machinery and farm equipment, and to set up modern irrigation systems such as drip irrigation and sprinkler irrigation. Considering research findings only 19.2% of the producers had access to credit services and 80.8% did not receive or had no access to credit services. This figures show that farmers in the locality have not utilized the opportunities credits and long term loans.

Marketing information is becoming extremely important as the strength of economies rely on services and to understand the specific needs of customers better [25]. The Market information is the function of providing scientific research and new knowledge to producers through personal/professional networks tools (trader, friends/neighbor, development agent, NGOs, university), and public information system (market bulletins, radio, television, message blackboards at market places) with the objective of improving their production, income, and (implicitly) life quality. According to the study on the market information; 41.6% of producers acquired market information regularly, and 58.4% of them did not receive market information

regularly. These figures indicate that more than half of the almond farmers in the research area did not acquire regular market information indicating that they did not follow new developments in almond market. This may prevent to update their knowledge and information according to new circumstances emerging in almond markets.

CONSENT

As per international standard players' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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