



Original article

Contract Farming in Buckwheat Cultivation

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Abstract

Contract farming is a deal between a producer and a buyer regarding cultivation of an agricultural product characteristically. In reality, terms and conditions of these contracts can alter dramatically. It can refer to those arrangements involving public firms, government organisations or NGOs and can also refer to private schemes. In this paper, it is only focused on contract farming on arrangements between farmers and private actors. In recent years, buckwheat has gained increasing notice as a promising functional food, owing to its several human health issues and lack of gluten. This study examines buckwheat farmer's involvement in contract farming in districts of Gümüşhane province which is in the northeast of Turkey. An empirical analysis of the contract farming regarding the buckwheat farmers and postharvest practice has been provided. The survey was conducted in Kelkit, Köse and Şiran districts as only production places of the buckwheat in the province. Data collected from 30 farmers who are engaged in contract farming model. According to data, issues of the contract farming, marketing channels of the buckwheat and perspectives of the farmers for the buckwheat production with contract farming are addressed. The findings of this study reveal that the contract farming model, mostly eliminates the marketing-related concerns of the farmers in the region. Perceive benefits derivable from beginning to buckwheat contract farming was measured based on the following proposals (the commitments to purchase product, the market guarantee, the compliance with the contract terms, purchasing at the agreed price and timely payment) was evaluated using 5 point likert scale. As a result, buckwheat contract farmers should be monitored by the contract buyer for the continuity of the production.

Keywords: Agricultural production, Buckwheat, Contract farming, Contract farmers, Gümüşhane.

Received: 25 July 2023 * **Accepted:** 24 October 2023 * **DOI:** <https://doi.org/10.29329/ijjaar.2023.630.9>

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INTRODUCTION

Agricultural sector is one of the most important sectors of Turkey, having about 24.1 million hectares of the farmland and employing 3 million farmers. A fundamental view is that the country population carries on to raise while the farming remains below expectation. World Bank (2023) reveals that agriculture which accounted for there about 25% of the gross domestic product of some developing countries is important to economic growth on the other hand in Turkey it is contributing 7% of the country's gross domestic product (GDP). Crop products include grain and other crop products in the agricultural production of Turkey. According to data from Turkish Statistical Institute (Turkstat) in Turkey, while total grain production was 33 468 699 tonnes in 2018-2019, this amount was 33 401 704 tonnes in 2019-2020 marketing year and when the area sown is considered, it was 10 779 036 ha and 10 645 742 ha in the relevant years respectively. Turkish Republic (TR) Ministry of Agriculture and Forestry reports that the livelihood of almost all of the population living in rural areas is agriculture. Therefore, the farming in the economy of the countries and creating new alternative livelihood is paramount (Gaffney et al., 2019). Growth at a slow pace in farming can pioneer lacking the skills, technologies, financial services and agricultural policies instability in the country (Collier and Dercon, 2014). As it was clarified by Mishra et al. (2016) growers notice that skills and abilities in developed agricultural production such as the selection of alternative product kinds, off-season crop production and suitable technologies in harvest time are the key to increase profitability. Alternative crop production is an important advantage for a country like Turkey with a wide variety of climatic conditions. Finally, a study by Bozkurt and Kaya (2020) brings to an issue that increasing crop production and profitability mostly are attached to on the improving of land use, climatic, financial, fiscal, monetary policies and new alternative crops.

Buckwheat is not related to cereals such as wheat, barley and rice. It is one of the main alternative products in the crop production pattern in the world and is an important food item due to its components. Buckwheat production has become one of the most developed crop production. In addition to its nutritive effect, food that protect and improve well-being and reduce the risk of disease are defined as functional food (Erbaş et al., 2008), and the increase in consumers' interest has led to the supply of such products in the market (Sedej et al. 2011). The buckwheat production is not limited to producing buckwheat for bakery products only, but also produces many by products such as in animal feeding, in the paint industry, in the beekeeping as nectar. Russia's share in the world buckwheat production (1 875 067 tons) in 2021 was 919 147 tons, followed by China (502 369 tons) and Ukraine (105 780 tons). Russia accounted 48% of the world's total buckwheat production in 2021 (FAO, 2023). Buckwheat, which is produced in many countries of the world and has begun to take its place in international trade but it is not commercially cultivated in Turkey. Based on the data of Turkstat (2023), there was 1 359 tons of buckwheat production with area sown 8 482 decares under total cereal production. The yield of the

buckwheat in Turkey was 147 kg per decare in 2021 and it was 160 kg per decare in 2022. With this data it could be said that both area sown and yield is relatively low when it is compared with other cereals.

To promote alternative crop production in rural areas, buyers can be encouraged to form collaboration with farmers based on contract agreements. The farmer makes decisions about what to produce, how much and which inputs to use in non-contract farming. In this case, it will be possible for the capital to dominate in agriculture only if the production decisions are not taken by the farmer. Linking smallholder farmers to markets with the contract farming (hereafter CF) is also one solution to overcome high levels of poverty in many underdeveloped areas (Meemken and Bellemare, 2020). As it is stated in Singh and Raj's (2019) study that farmers especially the smallholders have a difficulty to participate in the market as the condition of the market is changing every day and large farms can have easy access to enter the big markets. CF has recently encouraged as a key solution to combine small scale farmers into part of a market-led agricultural development (Vicol et al., 2021). Therefore, CF can be a method that should be applied for the commercialization and industrialization of the buckwheat production in the research area and also the CF strives to make a steady supply of products which is very important given market liberalization and globalization (Saigenji and Zeller, 2009).

This paper is presented as a qualitative work with focus only contract farming and how it helps to promote newly introduced crop like buckwheat in the research area. While many factors inhibiting agricultural production has been introduced in the beginning, the contract farming can be good alternative the promotion of buckwheat and availability of contract farming is important for the local farmers. This paper demonstrates this point qualitatively and also examines the perceived benefits accruable by the farmers in buckwheat contract farming.

MATERIALS and METHODS

The data used in this study has been provided from face to face interviews that conducted in June and July 2021 in districts of Gümüşhane province. Due to the limited number of buckwheat farmers in Gümüşhane province, no sampling was made in the research area. As a qualitative work with basic on only 30 farmers (total available sample) is presented by solely focusing on contract farming. Since there was only one buyer in the region, the survey questions were directed to 30 farmers engaged in contract farming and the relevant buyer.)

Data collection was conducted using structure questionnaire complemented with schedule interview. The question form used a detailed form to have enough information on farmers such as age, sex, education, household size and farming experience. To give a clear picture of perception of buckwheat farmers on the accruable benefits of contract farming, a 5-point Likert scale (1: strongly disagree; 5: strongly agree) was used. This study makes a hypothesis that growers encounter many difficulties while cultivating and selling their products and these difficulties encountered in farming are

connected to contract farming. The Likert scale can evaluate the degree of farming difficulties (Hoang and Nguyen, 2022).

RESULTS and DISCUSSIONS

Farmers' Descriptive Characteristics

It is noteworthy that in the research region, all contracted farmers are men and farming is seen as a male's job (Table 1). This finding is line with Yisa et al.'s study (2022) that larger proportion of rice contract farmers in Benue State of Nigeria are male.

The majority of the farmers' age changes between 51 and above (43.3%). On the other hand, %36.7 of the participants' age varies between 41 and 50 years. This result shows that the contract farmers are still in their effectual and productive ages. This means the farmers might be risk takers and enthusiastic in the sustainability of the contract farming model. This intersects with Akanbi et al.'s, (2019) result that the average age of the contract farmers is about 42 years. Table 1 also indicates that the years spent in education are 5-8 years (30%) and this value corresponds secondary school. With this, majority of the farmers are high school (26.7%) or university graduates (26.7%). This finding tells us that the level of education for the farmers is sufficient. Farmers with a high level of education may be more open to change with alternative production methods. It was mentioned in the study by Tambo and Wünsch (2017) that growers with a higher level of education are more willing to tolerate modern agricultural production opportunities such as contract farming that involves risk-taking actions.

When the household size of the enterprises is examined, it is seen that the majority of farmers consist of households in the 0-5 (90%) range. Large household size can be advantage in agricultural production in rural areas and this might positively affect agricultural production. Because, workforce is one of the important inputs in small-scale farms. Mostly, family workforce is used by smallholders in production or harvesting time. Whereas, the household size of the farms included in this study is relatively low. This finding is in agreement with Khan et al. (2019), who outlined that potato contract farmers' average household number is 4.37. The years of farming experience vary by a majority between 1-10 years (36.7%) for the farmers. Moreover, 23% of the farmers has got farming experience between 11 and 20 years. According to this result, we can say that the farmers have got enough experience in agricultural production, but they can also get farming experience over the years and this might affect their engagement in contract farming. As it is stated in Ganewo et al.'s study (2022) the more years farmers are in crop production, the better they get involved in terms of contract farming model. So, it was anticipated that buckwheat cultivation experience positively affect engagement with buckwheat contract farming.

Table 1. Descriptive of farmers in terms of characteristics (n=30)

Variables	Frequency	%
Gender		
Male	29	96.7
Female	1	3.3
Age		
< 30	3	10
31-40	3	10
41-50	11	36.7
51 and above	13	43.3
Year of education		
1-4 Primary school	5	16.7
5-8 Secondary school	9	30.0
8-12 Highschool	8	26.7
>12 University	8	26.7
Household size		
< 5	27	90.0
6-10	3	10.0
11-15	-	
Experience in farming		
1-10	11	36.7
11-20	7	23.3
21-30	6	20.0
31-40	4	13.3
41 and above	2	6.7

Buckwheat Farmers' Crop Production Pattern (2020)

The crop production patterns of the farmers are shown as average cultivation area, average production amount and average sales price in Table 2. As mentioned earlier the farmers only produce buckwheat with contract farming model. There are no buckwheat farmers served by traditional and other form of buyers in the research area. Therefore, no comparative analysis can be established. The full count sample from this study has only 30 farmers who are linked to contract farming. The remaining farmers are producing their crops apart from buckwheat with the traditional method which is non-contract farming. It is seen that the farmers' production patterns are mainly wheat, barley, oat, corn and alfalfa. Considering the average production amounts, the highest production amount is corn with 123

333 kg, followed by wheat with 43 480 kg, alfalfa with 12 319 kg, oats with 11 784 kg and barley with 8 814 kg, respectively. Although the number of potato producers among the total farmers is low, the average amount produced is 26 500 kg. Considering the prices received by the farmers, it is understood that the highest price per kg belongs to dry beans and buckwheat. It is among the results that the unit sales prices of products such as corn, wheat, barley, and alfalfa, which are included in the traditional production pattern, are much lower. According to this finding, it is extremely important to increase the income of the farmers by going out of the traditional production pattern and directing the farmers to crop products with higher economic returns. In this respect, it is necessary to conduct studies to increase the cultivation area of buckwheat as an alternative product and to increase the production amount. In the study by Singh and Raj (2019), the growers earned more by growing basmati under contract farming and on an average increase in gross income under contract farming was found as 9.69%.

Table 2. Buckwheat farmers' crop production pattern

Crop	Production Method (1: Contract Farming, 2: Non-contract Farming)	Average Cultivation area (decare)	Average Total Production (kg)	Average Price (kg/TL)
Dried Bean	2	14.9	1699	23.1
Wheat	2	165	43480.9	1.71
Corn	2	28.6	123333	1.85
Barley	2	34.8	8814	1.67
Oat	2	47.9	11784	1.08
Eincorn	2	10	1000	5
Potatoes	2	10	26500	1.35
Clover	2	25	12319	1.21
Buckwheat	1	23	1082.8	4.46

*The average exchange rates between Turkish Lira (TRY) and the Euro (€) for June 2021 was 1 EUR = 10.3832 TRY.

The Form of Contract Farming in Buckwheat Cultivation

The orientation to alternative products like buckwheat in agriculture is not easy for farmers due to traditional production habits. Generally, the transition of farmers to alternative products is realized through contract farming models with the initiative of private firms or entrepreneurs. Buckwheat production with the contract farming model in Kelkit, Köse and Şiran districts of Gümüşhane province started in 2018 under a private firm. The contract farming experience of the farmers in buckwheat cultivation changes from 1 to 3 years and covers an average of 1.51 years. Contract buyers generally

supply growers with inputs to use in production under predefined terms such as fertilizer and pesticides (Dubbert et al., 2021). However, in contrast to widespread production inputs according to the agreement between the farmers and the firm, the buyer only supplies limited inputs in this research. Inputs that the buyer provides to the farmers are generally limited to seeds. Intervention of the buyer in decisions regarding buckwheat cultivation is given in Table 3.

Table 3. Intervention of the buyer in decisions regarding buckwheat cultivation.

Statements	Average
Determining the sowing time	3.44
Determining the type and amount of seed to be used	3.41
Determining the type and amount of fertilizer to be used	2.60
Determining the type and amount of pesticide to be used	1.58
Determining the number and amount of irrigation	1.51
Determining the harvest time	3.03

*(1: None 2: Slightly 3: Neutral 4: Quite 5: Definitely)

To compare the production amount for the buckwheat in the study area, both 2019 and 2020 were considered in this study. As it is seen from Table 4, the total amount of the buckwheat production in 2019 was 32 785 kg, and it was only 27 070 kg in 2020. As 76.66% of the buckwheat farmers who are engaged in the contract farming in 2019, this rate decreased to 40% in 2020.

Table 4. Buckwheat production amount in 2019 and 2020.

Crop	2019	2020
Total Buckwheat Production (kg)	32 785	27 070
Contract Farmers (%)	%76.6	%40

Analysis of Farmer's Perception Towards Contract Farming

Knowing how the farmers evaluate the contract farming in terms of production and marketing, is considered important especially for the adaptation of farmers to alternative agricultural products such as buckwheat. For this purpose, the perceptions of the farmers about the contract buckwheat farming model were examined. A 5-point Likert scale was used for the responses of the farmers to the propositions are shown in Table 5. According to the results, the interviewed farmers strongly agree with the propositions such as the buyer's compliance with the commitments to purchase the entire product (4.75), the market guarantee (4.61), the buyer's compliance with the contract terms (4.50), the purchase of the buckwheat at the agreed price (4.43) and timely payment (4.22). These results indicate that for the promotion of new crops like buckwheat; market guarantee, timely payment, price are very important for the local farmers to participate contract farming. This also translates to higher buckwheat income at the farm level. Because, farmers are of the view that they need financial support to buy inputs like fertilizer, seed and harvester or tractor services to enable gain high yield (Yakubu et al., 2022). These

results are also consonance with Yisa et al. (2022) who pointed out that contract farming helps farmers' inputs and enhances their earnings (4.87 and 4.77).

The contract farmers reported that they agreed with the proposition "contract farming is more reliable than traditional one" at a moderate level (3.39). In the study of Ruml et al., (2021) it is stated that there is an additional advantage of the agreements between farmers and buyer because of the difficulty of finding buyers for larger amounts in traditional chain. Therefore, working with contract buyer can be an advantage for the local small scale farmers.

There are also some propositions that the farmers have close to the indecisive attitude and agree less. These propositions are as follows; "The buyer makes fair decisions (2.89)", "It is possible to obtain more yield (2.75)", "Contract farming can be more profitable (2.71)", "Higher price in contract farming (2.61)", "Consultancy service in the production time (2.25)", "Lower production cost (2.14)", "Meeting demands of buyer in terms of product quality (2.11)", "I have enough knowledge about contract farming (2.04)", and "The buyer provides credit facilities during the production and harvest time (1.18).

Table 5. Farmers' perceptions towards contract farming.

Statements	Average*	Std. Dev.
The buyer receives the entire product promised in the contract.	4.75	0.4410
There is a market guarantee in contract farming.	4.61	0.4973
The buyer complies with the terms of the agreement.	4.50	0.6383
The buyer buys the buckwheat at the agreed price.	4.43	0.8357
The buyer pays the crop prices on time.	4.22	1.0500
Contract farming is more reliable than non-contract farming	3.39	1.1001
The buyer makes fair decisions when it interferes with production decisions.	2.89	1.4489
It is possible to obtain higher yields in production in contract farming.	2.75	1.1746
Contract farming is more profitable than traditional farming.	2.71	1.1501
A higher price can be obtained in contract farming than in traditional one.	2.61	1.1333
The contract buyer provides continuous consultancy service during production.	2.25	1.2656
The cost of production in contract farming is lower than in non-contract one.	2.14	1.0789
In terms of crop quality, I can meet the demands of the contracted buyer.	2.11	0.7373
I think I have enough knowledge about contract farming.	2.04	1.1380
The buyer provides credit facilities during the production and harvest time.	1.18	0.7724

*Likert Scale Mean: 1-Strongly disagree; 5- Strongly agree

Conclusion

Contract farming, which is used as a tool in the industrialization of agriculture, especially in developing countries, is a model that should be evaluated in increasing the production crops in this context. For this reason, it is necessary to analyse the internal dynamics in the current agricultural production system and support the technical infrastructure for the implementation of contract farming.

Policies to directly improve the contract environment of both the buyer and the farmer, the specific problems faced by farmers while signing the contracts, and the plans that local authorities will prepare in this context are extremely important. The most important problem faced by the farmers is buckwheat yield. In this respect, technical consultancy to be given to the farmer in the process from planting to harvest will be an important factor in the sustainability of production. In addition, in order to continue buckwheat production with contract farming model, agricultural credits or grants that will support the loss of farmers should be increased and programs specific to buckwheat farmers should be prepared.

The buyer's support in production and post-harvest chain in contract farming will increase the buckwheat productivity. Therefore, strict controls over the buckwheat cultivation create not only sustainability of production with better quality, also the increase the buckwheat productivity. This paper indicates that the production and post-harvest practices on contract farmers should be enhanced by the buyer and also by possible buyers, so farmer's status should not be tied to only a buyer. The awareness level of CF is found to be less in case of farmers. Training and advertisements should be set in a manner which extends knowledge about CF issues among the farmers in particular. In terms of the results of this study it can be said that that the farmers state the same perceptions on four of the top five advantages of CF such as assured purchasing, guaranteed market, reliability of the contractor, guaranteed price and timely payment. In conclusion, CF can progress farmers' welfare and reduce cost of inputs. So, the buckwheat farmers should be controlled by the buyer for the sustainability of the cultivation.

Acknowledgement

The authors would like to thank the experts of agriculture offices of the districts for their support to get the list of the buckwheat farmers. Thank the farmers for their dedicated willingness to participate in this research.

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