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ARAŞTIRMA MAKALESİ

Current Situation and Demands of Farmers in Iraq: Evaluation of Chickpea Production and Agricultural Sustainability

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Abstract

Food security and sustainability of food supply; are essential for sustainability principles. Chickpea has played an important role in human nutrition and health for centuries due to its high protein, amino acid content, rich mineral and vitamin content as well. Additionally, in terms of sustainable agriculture; Due to its main features such as being drought tolerant, being able to be grown as winter or second crop, and having a symbiotic nitrogen fixation mechanism due to being a legume plant, it is definitely recommended to be found in rotation and human nutrition.

Chickpea is a type of legume that is low in production in Iraq. Today, it is known that there is a serious and dangerous decrease in chickpea production in Iraq. Chickpea farming in Iraq is on a small scale, and there are few technical and economic studies on the subject.

In this research, the information obtained as a result of the survey conducted with farmers and chickpea producers in different regions of Iraq in 2021 was evaluated. Within the scope of the study, in Iraq; Questions about farming and chickpea cultivation were asked to 70 randomly selected farmers from the regions where chickpea is grown in Mosul, Erbil, Duhok and Sulaymaniyah, and the results were evaluated as "%" (percentage) unit. According to the results of the research, the farmers producing chickpeas in Iraq; It has been determined that there is a need for support in chickpea farming, including sowing, fertilization, irrigation, disease and pest control practices. As with all other plants, cultivation techniques have remarkable effects on yield and quality of chickpea plants. For these reasons, it is of great importance to support the farmers in the matters they need and to carry out different studies on the subject and convey them to the stakeholders to provide sustainability.

Irak'ta Çiftçilerin Mevcut Durumları ve Talepleri: Nohut Üretiminin Değerlendirilmesi ve Tarımsal Sürdürülebilirlik

Öz

Sürdürülebilirlik ilkelerinden hareketle; gıda güvenliği ve gıda arzının sürdürülebilirliği esastır. Nohut, yüksek protein ve amino asit içeriğinin yanı sıra, zengin mineral ve vitamin içeriği nedeniyle de yüzyıllardır insan beslenmesinde ve sağlığında önemli bir rol oynamıştır. Ayrıca, sürdürülebilir tarım açısından; kuraklığa toleranslı olması, kışlık veya ikinci ürün olarak da yetiştirilebilmesi, baklagil bitkisi olması nedeniyle simbiyotik azot fiksasyon mekanizmasına sahip olması gibi temel özelliklerinden dolayı; münavebe ve insan beslenmesinde kesinlikle bulunması tavsiye edilmektedir.

Nohut, Irak'ta üretimi düşük olan bir baklagil türüdür. Günümüzde, Irak'ta nohut üretiminde ciddi ve tehlikeli bir düşüş olduğu bilinmektedir. Irak'ta nohut yetiştiriciliği küçük ölçekli olup, konuyla ilgili teknik ve ekonomik çalışma sayısı da oldukça azdır.

Bu araştırmada, 2021 yılında Irak'ın farklı bölgelerindeki çiftçiler ve nohut üreticileri ile yapılan anket sonucunda elde edilen bilgiler değerlendirilmiştir. Çalışma kapsamında Irak'ta; Musul, Erbil, Duhok ve Süleymaniye'de nohut yetiştirilen bölgelerden rastgele seçilen 70 çiftçiye; üretim teknikleri ve nohut ekimi ile ilgili sorular sorulmuş ve sonuçlar "%" (yüzde) birimi olarak değerlendirilmiştir. Araştırma sonuçlarına göre, Irak'ta nohut üreten çiftçilerin bildirdiğine göre: Nohut yetiştiriciliğinde ekim, gübreleme, sulama, hastalık ve haşere kontrol uygulamaları dâhil olmak üzere desteğe ihtiyaç duyulduğu tespit edilmiştir. Diğer tüm bitkilerde olduğu gibi yetiştirme tekniklerinin; nohut bitkisinin verim ve kalitesi üzerinde de dikkate değer etkileri vardır. Bu nedenlerle çiftçilerin ihtiyaç duydukları konularda desteklenmesi ve konuyla ilgili farklı çalışmaların yapılması ve paydaşlara iletilmesi; sürdürülebilirliğin sağlanması açısından büyük önem taşımaktadır.

Introduction

The agricultural sector is considered as one of the vital sectors in the economy of the countries due to the food and job opportunities provided by the agricultural activity to the population and the raw materials for the industry. The agricultural sector in Iraq is considered the second largest economic sector after oil, contributing about 25% of the workforce and about 5-10% of the gross domestic product. The agricultural sector in Iraq has difficulties due to the decrease in local production and the foreign dependency of the state (Abd-Allah, 2020; Survey Participants, 2021).

The Food and Agriculture Organization of the United Nations (FAO), on 20 December 2019 in Rome, on the issues of food security besides nutrition in the world; took three decisions, including awareness initiatives focusing on phytosanitary, food safety and legumes. Due to the loss of approximately 40% in plant products on a global scale every year due to plant pests; it was stated that it is of great importance to carry out studies on improving plant health, public opinion and policy. From an economic point of view, cost of plant diseases to global scale economy is annual $220 billion, while pests cost $70 billion. In the same meeting, FAO Deputy Director General Maria Helena expressed the importance of the issue with the statement that "The International Year of Phytosanitary Health is an important attempt to emphasize the significance of plant health, increasing the security of foods, environmental protection and biodiversity besides promoting economic growth". Another issue that came to the fore at the meeting was; The International Pulses Day, which will maintain the positive momentum regarding healthy and nutritious pulses rich in protein and nitrogen, will be celebrated every year around the world on February 10, and the importance of legumes for sustainable production is once again emphasized (FAO, 2018).

At the meeting by an organization of the Food and Agriculture Organization (FAO), on 7 February 2020 in Rome, FAO Director-General Qu Dongyu; He emphasized the important role of legumes in food security and a healthy and balanced diet for all. He stated that legumes have an important role in achieving the sustainable development goals set for 2030. Qu said that legumes also contribute to the achievement of environmental and biodiversity targets. The countries participating in the organization were advised to encourage the cultivation of pulses (FAO, 2020).

Chickpea (*Cicer arietinum* L.) is one of the most important legumes and food in the world due to its high content of carbohydrates (60% total), fat (5.9%), fiber (7%) and protein (21%), as well as vitamins, calcium and iron. one of the sources. Chickpea is an important legume (*Leguminosae* family) plant due to its drought tolerance and short vegetation period. Chickpea is considered to be one of the prominent plants in sustainable agriculture, as it has a nitrogen fixation mechanism owing to *Rhizobium ciceri*, which it lives in symbiotically. Besides its importance in human nutrition and medicinal use, chickpea hay is an important feed source in animal nutrition (Minarro Vivas, 2013; Pontieri et al., 2013; Pantaleon-Velasco et al., 2014; Flores-Silva et al., 2015; Aziz and Peksen, 2020; Karayel et al., 2020; Survey Participants, 2021). Various fungal diseases are seen in chickpea agriculture that affect the production amount and quality, and one of the most dangerous diseases seen in chickpea plants in many countries of the world is anthracnose (Ascochyta blight). In case of favorable environmental conditions for the said disease factor, it sometimes causes serious losses that can reach 100% in yield (Kahraman and Ozkan, 2015; Ceran and Onder, 2016).

Chickpea farming in Iraq especially; It is wide in Mosul, Erbil, Duhok and Sulaymaniyah, and seeds are sown in the first half of March. However, it is known that chickpea sowing takes place in the autumn period and winter chickpea varieties are needed in this direction, due to the negative effects of high temperatures and low humidity on yield, especially during the flowering period. In case of sowing chickpeas in winter; It is known that double seed including pod feature and yield increase, 7-10 cm increase in plant height is realized and plant height increase helps harvest with agricultural machinery (Survey Participants, 2021).

It is seen that the chickpea producing area in Iraq during the 1987-2019 period is quite variable.

Between 1987 and 1999, the state directed farmers to plant strategic crops such as wheat due to the economic blockade and ongoing wars in the 1990s, while in 1993 and 1999, chickpea cultivation stopped completely in Iraq (CSO, 2021a, b; Survey Participants, 2021). In 2001, the cultivated chickpea areas in Iraq expanded due to the high prices in 2000. In 2014 and 2015, chickpea cultivation was stopped due to the war in Iraq. There are no reports of its cultivation in 2018 as well. Although chickpea production in Iraq is in small quantities, it is known that the existing agricultural areas are large and this is due to the conditions of the country or the policies followed in the cultivation and production (CSO, 2021a, b; Survey Participants, 2021).

Agricultural production in Iraq is still insufficient to meet the country's food needs, and there is still dependence on imports to meet the basic needs to feed the Iraqi people, especially legumes and grains, and this issue poses a serious threat to food security (Survey Participants, 2021).

Agricultural policies in Iraq have faced many problems that have stopped enforcing the laws of sustainable agricultural development goals. Especially after the 2003 war, widespread administrative and financial corruption and unlawfulness were observed in all Iraqi institutions, especially in the institutions related to the agricultural sector. As mentioned above, although chickpea is a very important legume plant, cultivation areas and yields are extremely low in Iraq. Technical and economic studies on chickpea farming are very few. This research was carried out in order to determine the difficulties encountered in chickpea farming in Iraq and to raise awareness on the subject by publishing the results.

Material and Methods

Present research was realized to have information about farmers and agriculture in Iraq, besides to have information about chickpea farming; it was carried out in order to determine the current situation and to make suggestions according to the results. This research was carried out in Iraq in 2021; it was carried out by interviewing randomly selected farmers from the chickpea growing regions in Mosul, Duhok, Erbil and Sulaymaniyah. In the study, 28 questions about farming and chickpea cultivation were asked to 70 randomly selected farmers according to “Systematic Sampling Method” basically. Obtained data which are numerical results. Were evaluated with the computer-based "Microsoft Office-Excel" program and expressed as a percentage (%) unit. While preparing the questions directed in this survey study; the problems experienced in the region were tried to be determined as meticulously as possible, for this purpose; A survey study was conducted before the survey in order to obtain information from both universities and producers in Iraq as well as consumers. After the preparation of the survey questions; important regions producing chickpeas in Iraq were identified and participants were recruited from each of the regions in question (Çiçek and Erkan, 1996; Şenol, 2012; Kahraman, 2017).

Results and Discussion

The questions and answers within the scope of this study directed to the farmers producing chickpea in Iraq (Mosul, Duhok, Erbil and Sulaymaniyah) are given below as summarized by; Questions (“QUS”) and answers (“Ans”) that were presented according to International System of Units. All the “Ans” are presented by the “%” unit.

QUS 1-): What size do you manage or farm for chickpea?

Ans 1-): A) 0 - 500 m^2 = 33% B) 500 – 1 300 m^2 = 39% C) 1 300 – 2 500 m^2 = 19% D) More than 2 500 m^2 = 9%

QUS 2-): How many years have you been dealing with farming?

Ans 2-): A) 0 - 5 year = 39% B) 5 - 10 year = 40% C) 10 - 20 year = 15% D) 20 and more = 6%

QUS 3-): What is your education level?

Ans 3-): A) Uneducated = 11% B) Primary education = 19% C) High school = 25% D) University = 21% E) Other = 24%

QUS 4-): Do you have a source of income other than crop production?

Ans 4-): A) Yes = 78% B) No = 22%

QUS 5-): Do you have enough tools and farming equipment?

Ans 5-): A) Yes = 85% B) No = 15%

QUS 6-): Do you apply crop rotation?

Ans 6-): A) Yes = 100% B) No = 0%

QUS 7-): What plants do you grow in crop rotation?

Ans 7-): A) Cereals = 70% B) Vegetables = 20% C) Forage crops= 10%

QUS 8-): What is your sowing method?

Ans 8-): A) Seeder = 100% B) Spreading = 0%

QUS 9-): Do you apply fertilizer before sowing?

Ans 9-): A) Yes = 82% B) No = 18%

QUS 10-): Which fertilizer do you use before sowing?

Ans 10-): A) Diammonium phosphate (DAP) = 97% B) Others = 3%

QUS 11-): Do you use certified varieties?

Ans 11-): A) Yes = 32% No = 68%

QUS 12-): Why you do not use certified varieties?
Ans 12-): A) Expensive = 55% B) Have own seed = 28% C) Lack of support =17%
QUS 13-): Where do you provide the seeds?
Ans 13-): A) Own = 54% B) Farmers = 15% C) Agricultural Office = 31%
QUS 14-): Do you apply pesticides?
Ans 14-): A) Yes = 92% B) No = 8%
QUS 15-): What pesticide do you apply?
Ans 15-): A) Seed = 15% B) Post emergence = 85%
QUS 16-): Do you use the same pesticide every year?
Ans 16-): A) Yes = 86% B) No = 14%
QUS 17-): Which irrigation method do you use?
Ans 17-): A) Drip = 83% B) Sprinkler = 17%
QUS 18-): Do you use herbicides before planting?
Ans 18-): A) Yes = 9% B) No = 91%
QUS 19-): Have you encountered a disease or pest problem?
Ans 19-): A) Yes = 90% B) No = 10%
QUS 20-): What diseases do you encounter?
Ans 20-): A) Root rot = 27% B) Anthracnose = 53% C) Stem rot = 20%
QUS 21-): Do diseases cause to great losses in your crops?
Ans 21-): A) Yes = 79% B) No = 21%
QUS 22-): Do you sell the products immediately after harvest?
Ans 22-): A) Yes = 49% B) No = 51%
QUS 23-): Where do you store the product?
Ans 23-): A) Silo = 11% B) Private store = 39% C) Seller = 20% D) Other = 30%
QUS 24-): Do you think that with the increase in the amount of fertilizers and pesticides used in agriculture, the amount of product that can be obtained will increase equally?
Ans 24-): A) Yes = 46% B) No = 54%
QUS 25-): Do you visit / communicate with agricultural organizations or talk to experts on agricultural issues?
Ans 25-): A) Yes = 35% B) No = 65%
QUS 26-): Where do you get information about crop production?
Ans 26-): A) Own experience = 34% B) Available information = 12% C) Other = 34% D) Agricultural companies = 20%
QUS 27-): Do you plan to continue chickpea farming?
Ans 27-): A) Yes = 67% B) No = 33%
QUS 28-): What are the reasons that prevent you from continuing chickpea farming?
Ans 28-): A) Expensive =25% B) Needs to time and care = 18% C) Tiredness =31% D) Other = 26%

Results of the present research showed that chickpea cultivation in Iraq is generally on an average of 500 - 1300 square meters, the average working of farming varies between 5-10 years and the education level of those farmers is high. The percentage of uneducated people is low, a large proportion of agricultural employees have a non-farm income source, and many farmers have adequate agricultural tools for agricultural production and rotation with cereals due to cost and diammonium phosphate (DAP) as a base fertilizer largely. While farmers prefer to use seeds obtained from their own products instead of certified seeds, spraying; It is done after the disease appears and the most used irrigation method among farmers is drip irrigation. Farmers declared that they did not use herbicides before planting. The disease is widespread and the most common disease is anthracnose. Since the buyer cannot be reached immediately after the harvest, the products obtained are kept in special warehouses or silos. If the farmers increase the amount of fertilizers and pesticides, the opinion on whether the production amount will increase or not has been determined almost equally. In addition, it has been revealed that the communication of farmers with agricultural organizations is quite weak.

The farmers stated that the most important problems they encountered in chickpea cultivation were the lack of government support, price instability and imports from abroad due to the wars and economic problems that Iraq had experienced in the last ten years. Farmers who do not intend to continue growing chickpeas stated that their efforts are not adequately rewarded or that they can grow other products that redound more.

It has been stated that the data needed to examine agricultural supports (Demirdöğen, 2020). Various researches have been carried out on agricultural production and agricultural policy around the world. Agricultural production has existed since the existence of humanity and enabled the progress of humanity. The agricultural sector, which is one of the essential requirements for human beings to survive, has its own characteristics and problems. With the increasing population day by day, the agricultural sector is experiencing productivity increases within itself. However, while agricultural productivity, especially in developed countries, is at high levels, it is accepted that productivity in less developed countries is far behind compared to other countries' levels. Agriculture, which is one of the oldest professions that have the opportunity to be applied in many continents in many continents at the global level, still maintains its importance on the basis of the economic activities of the countries. Agriculture builds bridges between sectors and societies and constantly needs capacity building. Due to its critical importance for human life, it needs political and economic intervention and is considered the cornerstone of socio-economic development. It is

seen that the level of development at the global level is directly proportional to the transition from the agricultural workforce to the industrial workforce. In the study of Hennessy (1998), it was concluded that the income support policy applied, which deals with the effects of income support policies provided in agriculture on production in the fields of wealth, insurance and matching, positively affects the input levels. Heerink et al. (2006) reported that, in China, it was concluded that the income support policy did not increase the grain production, the tax reduction used in non-agricultural areas increased the income, but it tended to increase the income inequality among the villages. Yi et al. expressed that (2015), the grain subvention program improved grain acreage. In a study, the agricultural policies followed by Turkey in order to adapt to the EU agricultural policies were examined, and it was concluded that the changes in agricultural support policies affected the rural areas shallowly and negatively (Kandemir, 2011). It has been stated that Turkey's agricultural sector should increase its export share and increase its competitiveness in the international arena (Kesgingöz, 2015). In addition to the expected welfare gains of consumers in Turkey, it has been concluded that the reflections on the total gross domestic product will result in a possible deflationary deficit (Doğruel et al., 2003). As a result of the examination of the effects of the common agricultural policy on Turkey, it was concluded that the agricultural sector was negatively affected as a result of the sanctions of the European Union and that the policies to be implemented in Turkey should be aimed at increasing social opportunities and rural development (Dilben, 2010). It was concluded that there is an inverse relationship between agricultural imports and relative prices (Aktaş et al., 2010). He concluded that the instability in prices in Turkey affects agricultural income (Karahan Uysal and Uysal, 2005). In a study conducted in Isparta, they concluded that as the land of the company expands, the opportunity to benefit from agricultural supports also increases (Yılmaz et al., 2006). It was understood that small producers and low-income households were affected the most by the shocks in agriculture and food prices, and it was concluded that output and income supports were more effective than agricultural input support (Taşdoğan and Bahçe, 2019). The transition from hunter-gatherer culture, which has little impact on the world, to agricultural culture has transformed the surface of the world (Christian and McNeill, 2011). It is generally accepted that agricultural transformation contributes to industrialization by increasing production and providing labors and capital to the industrial economy (Allen, 1994). With the industrialization process, labor productivity and the possibilities of using techniques increased, the development of cities accelerated, large industrial and transportation centers were formed, and it had a strong effect on the shaping of market relations with real content (Hacıyev and Bayramov, 2013). Cost, quantity, price and income instability, uncertainty and risk are always present in the agricultural sector. Although it is not possible to realize the increased productivity that can be achieved with the use of technology applied in the industrial sector, there is limited use of machinery, and the sector maintains its labor-intensive character (Saçık, 2019). Climate disruptions to agricultural production have increased over the past forty years while it is expected an increase in further in the following 25 years (World Bank, 2015). Focus on the basic factors in agriculture, considering both production and consumption, taking into account the concept of sustainability at all stages of the process, more effective and longer comprehensive studies on the basic issues of health-safety-environment will also support sustainable development.

Conclusion

According to the results of the research, it has been determined that there are important problems related to farming and chickpea cultivation in Iraq. According to the farmers, the main reasons for the lack of technical and economic studies in chickpea agriculture in Iraq are; lack of support due to wars and economic problems, imports and price instability are described as the main problems in chickpea agriculture. It has been determined that there are some mistakes and lack of information in the cultivation, fertilization, irrigation, disease and pest control practices of the farmers in Iraq, as in all other plants. It is obvious that the quality of the chickpea harvest is positively affected by the increase in the use of technology.

In the light of the results of this research, it can be said that more studies and economic and technical research on chickpea, which is an important legume plant, are needed to improve agricultural production and improve products in terms of quantity and quality. Appropriate cultivars that are well adapted to the region should be developed, and research is needed on cultivars that are highly productive and tolerant to diseases and pests. It is essential to provide information support to all farmers through agricultural extension services. Chickpea cultivation should be affordable for both farmers and consumers in terms of price, farmers should know that the product they produce will not remain in their hands or market it below its cost. It is important to control the imports in order to provide more effective planning and information at every stage of agricultural production, and to prevent the damage caused by the cheap entry of imported products into the market, especially

during the chickpea harvest. Chickpeas; For basic reasons such as its importance in nutrition and human health, its use in soil improvement and its symbiotic nitrogen fixation mechanism, it must be included in crop rotation systems, as well as being a drought tolerant legume plant, and the possibility to be grown both as a winter crop and as a second crop; It is an important plant for sustainable agriculture and sustainable food production, and it is an important food source whose production and consumption should be expanded. There is a need for studies on both the development of production systems and the determination of alternative consumption patterns for the main concepts of sustainability.

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