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Evaluation of the farms producing dry bean landraces by capital approach in the Middle Kızılırmak Valley of Turkey

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Abstract

This study was conducted to determine the opinions of the farmers producing dry bean landraces (DBL) at the regional level of Turkey (eight provinces). In total, 140 questionnaire forms were filled by DBL producers. The population and then the sample size were determined according to 2016-year-preliminary-study. The capital structures of the farms according to the production types were evaluated using the Five-Capital-Model approach, and differences were tested by parametric and non-parametric statistical methods. The study showed that 37.86% of the DBL producers produce as the home-garden-type while 62.14% of them as the field-type, which is larger than 0.1 ha. While home-garden-type producers majorly produce for their own family needs, commercial ideas and concerns are at the forefront for field-type producers. While field-type producers have higher values in terms of five capitals, home-garden-type producers move within a more traditional way of production. More than half of the producers indicate that they will continue to produce DBL; this ratio is higher in home-garden-type producers. This indication of approximately 25% of both types of producers wherein their children will continue to produce DBL, there is a need for more human labour, efficiency and profitability concerns, production mostly by the elderly population increasing the risk of future depletion in DBL-genetic resources. This calls for more efforts to increase the awareness among the young population on the importance and protection of genetic resources and to make special policies for the protection of genetic resources by policy makers and develop models based on genetic resources.

Keywords: genetic resources, natural resources, sustainability, Turkey

Introduction

Landraces are important sources of genetic resources and biodiversity. They are defined as crop varieties formed by management practices and natural selection pressure over generations of cultivation (Belay *et al*., 1995; Smale *et al*., 2001) and are adapted to local environmental conditions, while modern varieties have been improved usually by professional breeders (Kruzich and Meng, 2006), and usually have a broader genetic base and can therefore be important for breeding in terms of their valuable characteristics (Keller *et al*., 1991; Tesemma *et al*., 1998). Landraces are parts of cultural heritage and an indication for wealth of a country. They are important natural resources in terms of economic (NRC, 1993; Kan *et al*., 2016a; Jaradat, 2017), social (NRC, 1993; Evenson and Gollin, 1994; Morgounov *et al*., 2016) and private values (Brush, 1995; Zimmerer, 1996).

Genetic erosion is the main problems of Turkey like many countries. Increasingly, landraces are being replaced by modern cultivars which are less resilient to biotic and abiotic stresses (Newton *et al*., 2010). For these reasons, plant genetic resources (PGR) and levels of diversity have

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been identified and cultivated in many countries (Balkaya and Yanmaz, 2001).

Turkey is the gene centre for many crop species (Davis, 1985; World Bank, 1993; Kaya *et al.*, 1997; Tan, 1998). Unique geological and climatic conditions of Turkey have given the chance to endemic plant species. In Turkey, they still exist such as wheat, barley, oats, lentil, chickpea, apple and pear (Harlan, 1995; Bennett *et al.*, 1998). One of them is bean and is one of the most important plant species for Turkey in terms of direct use in human nutrition and nutrient content. Bean has come to Turkey in the 17th century and can be grown almost everywhere as dry grain or fresh grain (Sözen *et al.*, 2018). Dry bean (*Phaseolus vulgaris* L.), also known as common bean, is the most important food legume in the world (Urrea *et al.*, 2009). Turkey ranks in the top 25 countries in terms of dry bean production with 235,000 tonnes (FAOSTAT, 2018). South-Eastern Anatolia and Samsun-Tokat-Amasya are micro gene centres for beans (Şehirali *et al.*, 2005).

In this study, in the Middle Kızılırmak Valley, Turkey, which is an important diversity centre for dry bean landraces (DBL), the general characteristics of DBL producers and capital structures have been revealed. The capital assets are important indicators to understand farmers' behaviour. The decision of the farmers to produce landrace and production area size are behavioural facts and these are related to socio-economic situation of the farmers closely. Data obtained by determining the capital assets of DBL producers at the farm level and statistically testing them by production types are valuable for policy makers to create a policy for PGR to conserve and provide them with sustainability under the farms' conditions. Thus, it is thought that significant contributions have been made to the PGR field in terms of helping both scientific and policy-makers to make decisions via revealing the results on socio-economic side of PGR.

Materials and methods

Data and study area

The main material of this study consists of the data obtained through a questionnaire survey with 140 DBL producers from a total of eight provinces (Ankara, Aksaray, Çankırı, Kayseri, Kırıkkale, Kırşehir, Nevşehir and Sivas) in the Middle Kızılırmak Basin within the scope of the 'Middle Kızılırmak Valley Morphological and Molecular Characterization of Local Dried Bean Populations and Determination of Genotypes Resistant to Root Nematode and Socio-Economic Characteristics of Cultivators' Project supported by the R&D Projects Program of the General Directorate of Agricultural Research and Policy (GDAR) of the Ministry of Agriculture and Forestry (MoAF) (Fig. 1).

Because of lack of a specific database on the producers engaged in the production of landraces in Turkey, in the Middle Kızılırmak Basin where the study was conducted, surveys were conducted both to take samples from the producers of DBL breeding in 2016 and to conduct preliminary work. The production places and producers were determined by the experts in the project as a result of discussion with the experts of Province Directorates of Agriculture and Forestry, heads of the villages (Mukhtar) and local persons in the research area. At the end of preliminary study, samples were collected from 179 producers in 2016 and then the survey was conducted in 2017 by reaching 140 of these sample owner DBL producers (78.21%). In the DBL producers, questionnaires were filled in face to face with both male and female interviewees. Similar technique was applied in different landrace studies in Turkey (Kruzich and Meng, 2006; Kan *et al.*, 2015).

In this study, DBL producers are divided into two groups according to DBL breeding, namely home-garden production (HGP) and field production (FP). The production in HGP is the form of production made in the garden in front of the residence and usually in areas under 0.1 ha, while FP represents a form of production made in wider areas, generally wider than 0.1 ha. These two types of distinctions have been taken into consideration in the analyses made and capital structures of DBL-producing enterprises have been examined with a five capital model approach; they are natural capital, physical capital, human capital, financial capital and social capital. These five capitals come into prominence in the sustainable livelihood approach (Carney, 1998). Here, a simple set of definitions have been offered (Scoones, 1998; Mathur and D'Cruz, 2014).

Natural capital: the natural resource stocks (soil, water, air, genetic resources, etc.) and environmental services (hydrological cycle, pollution sinks, etc.) from which resource flows and services useful for livelihoods are derived.

Physical capital: comprises material goods or fixed assets which contribute to the production process rather than being the output itself – e.g. tools, machines and buildings. It is derived out of natural resources and mainly used to meet anthropogenic ends.

Human capital: skills, knowledge, ability to labour and good health and physical capability important for the successful pursuit of different livelihood strategies.

Financial capital: the capital base (savings, credit/debt, cash and other economic assets, including basic infrastructure and production equipment and technologies) which are essential for the pursuit of any livelihood strategy.

Social capital: social resources (social claims, networks, affiliations, social relations, associations) upon which people draw when pursuing different livelihood strategies requiring coordinated actions.

In addition, in this study, χ^2 independence tests were conducted in order to obtain information on whether or

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Fig. 1. The map of survey area.

not they are independent of each other in the analysis of cut-off variables, and the results were interpreted according to the χ^2 dependence coefficients (Çömlekçi, 2001). In the analysis of continuous variables for the two-level groups, the *T* test was performed in parametric cases and the Mann–Whitney test (M–W) and the two-sample Kolmogorov–Smirnov (K–S) test were applied for non-parametric cases. Variance analysis was used in parametric cases and Kruskal–Wallis test in non-parametric cases to determine whether there was a statistically significant difference between the groups with more than two levels. In case of significant difference in statistics, the Duncan analysis of multiple comparison method was applied in order to determine which group the difference originates from (Kesici and Kocabaş, 2007).

Results

In this study conducted in Middle Kızılırmak Valley in Turkey, the geographical characteristics of the production areas in which the DBL production activity was conducted and the general characteristics of the DBL production enterprises were tried to be revealed. All data were analysed according to the production type (home garden and field); as a result while 37.86% of the producers produce in the small garden of the home-garden-type, 62.14% of them produce in fields with a size greater than 0.1 ha. Table 1 presents some geographical features related to the areas where DBL production is made. According to Table 1, producers live at an average altitude of 1155 m. For the Central Anatolia Region, if we consider 1200 m and above as highland area, it has been determined that 42.14% of the producers live in highland areas above 1200 m. It is estimated that the home-garden-type production areas are at higher level than that of field-type production areas and it is statistically significant. It means that a significant number of agricultural enterprises continue to produce DBL in high places where they are not affected or far less affected by the general trend of agricultural development.

Another important factor in deciding to produce local population is distance from the main settlements. According to the results, it was determined that the average distance of DBL producers to the nearest district centre was 16.27 km and the distance to the nearest provincial centre was 71.96 km (Table 1).

Agricultural enterprises are willing to maximize their profits by acting on the basis of economic principles (minimization or maximization) in agricultural production. For this, the enterprisers want to use the capital elements (natural, physical, human, financial and social capitals) in the most effective way. One of the most important capital resources is natural capital, and it gives general information about the financial situation of the business, especially the business scope. It can also affect the size of the enterprise, the family labour force, agricultural income and the yield to be achieved in the unit area. In the research area, the average operating scope is 28.07 ha and 45.45% of this size is private property. The operating scope of home-garden-type DBL-producing enterprises is smaller than that of field-type DBL-producing enterprises and this difference is statistically significant (Table 2). In the research area, it was determined that the enterprises mostly produce by leasing. Upon examining Table 2, it is seen that DBL-producing agricultural farms mostly operate in

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Table 1. Geographical variables belonging to DBL production area

Geographical variables	Home garden	Field	Mean	χ^2/K–S *Z* Value
Altitude (m)	1279.64	1079.47	1155.25	−1.53 (K–S)***
Altitude code (%)				
Lowland (⩽1200 m)	35.85	71.26	57.86	16.942***
Highland (>1200 m)	64.15	28.74	42.14	
Distance to district centre (km)	19.96	14.02	16.27	−2.27 (K–S)**
Distance to province centre (km)	69.00	73.76	71.96	−0.88 (K–S)

*Statistically significant at the 90% confidence level, **statistically significant at the 95% confidence level, ***statistically significant at the 99% confidence level.

Table 2. Natural and physical capitals by production types

Capitals	Home garden	Field	Mean	χ^2/*T* value/K–S *Z* value/ M–W *Z* value
Natural capital				
Total land holding (ha)	18.00	34.21	28.07	−2.35***
Total irrigated land (ha)	2.06	7.92	5.70	−3.47***
Own irrigated land (ha)	1.22	4.52	3.27	−2.65***
Own land (ha)	8.83	15.15	12.76	−2.67 (K–S)**
Sharecropping land (ha)	0.51	2.77	1.91	−1.01 (M–W); 0.44 (K–S)
Rented land (ha)	8.66	16.29	13.40	−2.22 (M–W)**
Irrigated DBL land (ha)	0.05	1.15	0.73	−4.49***
Total DBL land (ha)	0.05	1.23	0.78	−4.85***
Share of DBL area in total area (%)	0.27	3.60	2.79	
Physical capital				
Having a tractor (% of farmers)	67.92	81.61	76.43	3.42*
Total machine asset (TL)	76,673.58	139,144.02	115,494.50	−2.55 (M–W)**
Having cattle (% of farmers)	49.06	48.28	48.57	0.01
Having sheep and/or goats (% of farmers)	7.55	9.20	8.57	0.11
Total animal asset (TL)	62,220.75	58,850.00	60,126.07	0.96 (M–W)
Total land asset (TL)	152,054.15	388,610.29	299,056.89	−3.00 (M–W)***
Total building asset (TL)	130,849.06	149,597.70	142,500.00	−0.25 (M–W)

*Statistically significant at the 90% confidence level, **statistically significant at the 95% confidence level, ***statistically significant at the 99% confidence level.

the dry agricultural system. The ratio of DBL production area in the total production area was 0.27% for home-garden-type agricultural enterprises, whereas this ratio was 3.60% for field-type production enterprises.

Physical capital, which is another important capital element for agricultural holdings, plays a vital role as it comprises basic infrastructure and producer goods supporting livelihoods. Physical capital affects the continuity and profitability of production, as well as gives information about the manufacturing power of the enterprises. Table 2 shows the distribution of physical capital by operating types and machine and land assets of the field-type DBL-producing enterprises are better than that of home-garden-type DBL-producing enterprises. In both types of enterprises animal assets are close to each other and about half of the enterprises are dealing with livestock activity.

Human capital represents the existence of skills, knowledge, workforce and health status that enable individuals to follow different livelihood strategies. Head of household is the main router in determination of the company's production strategy in countries such as Turkey where the family business is common. In this context, the factors related to the age, education level and experience of the head of

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Table 3. Human capital by production types

Capitals	Home garden	Field	Mean	χ^2/M–W *Z* value
Human capital				
Family size (person)	3.74	4.44	4.17	−1.87 (M–W)*
Women (person)	1.85	2.13	2.02	−1.23 (M–W)
Man (person)	1.89	2.31	2.15	−2.04 (M–W)**
Family labour size (MLU[a])	2.58	2.98	2.83	−1.83 (M–W)*
Women (MLU)	1.00	1.24	1.15	−2.02 (M–W)**
Man (MLU)	1.57	1.74	1.68	−1.39 (M–W)
Age of household head (years)	56.45	52.64	54.09	−1.98 (M–W)**
Education level (%)				
Illiterate (%)	1.89	0.00	0.71	6.33
Literate (%)	7.55	2.30	4.29	
Primary school (%)	77.36	85.06	82.14	
Secondary school (%)	11.32	8.05	9.29	
University (%)	1.89	1.15	1.43	
Agricultural experience (years)				
Plant production	28.62	26.98	27.60	−0.86 (M–W)
Animal husbandry	20.40	18.76	19.38	0.59 (M–W)
I will continue to produce DBL (%)				
Yes	79.25	60.92	67.86	14.09***
Perhaps and No	20.75	39.08	32.14	
My children will continue to produce DBL (%)				
Yes	24.53	26.44	25.71	1.88
Perhaps and No	75.47	73.56	74.29	

aMLU: man labour unit.
*Statistically significant at the 90% confidence level, **statistically significant at the 95% confidence level, ***statistically significant at the 99% confidence level.

household are important factors in determining the production strategy of the enterprise. In addition, household size and existing family labour force assets are the main indicators of human capital. By taking into account that dry bean production requires human labour more than other crops, family labour force will be important in creating DBL production strategy. Upon examining Table 3, it is determined that the household size is 4.17. The low number of households can create negative production pressures for products based on human labour, such as dried beans. In the region, it is stated that in recent years dry bean production has decreased due to the fact that it is based on human labour while the production of chickpeas has increased because it is based on machine-harvesting. The average age of the head of household in DBL-producing enterprises was determined as 54.09 and among them the household heads were found to be older in in home-garden-type DBL-producing enterprises.

Financial capital shows the existence of the money and equivalence requirements for businesses to implement different production strategies. In this study, more than half of the income sources of enterprises come from agriculture. While this ratio is more important in field-type production enterprises, non-agricultural income also plays an important role in home-garden-type producers (especially pensions). In home-garden-type agricultural enterprises, DBL production tends to be more of a hobby and eliminates the need of families rather than for economic gain. Also, more than 90% of agricultural enterprises identify themselves as medium and well-managed enterprises, indicating that they are not in financial difficulty. In the field-type DBL-producing enterprises, the ratio of rich enterprises is higher than that in the home-garden-type DBL-producing enterprises.

Social capital is a sine qua non for the development of society because it gives information, in any society, about the relationship of people to each other as well as their relation to institutions, the level of trust in society and the ability of working together and doing business. Protecting genetic resources and ensuring sustainability require societal consciousness and unity. In this study

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Table 4. Financial and social capitals by production types

Capitals	Home garden	Field	Mean	χ^2/Fisher exact test
Financial capital				
% Off-farm income	43.24	34.42	37.93	
% Farm income	56.76	65.58	62.07	
% Plant production income	62.84	71.50	68.13	
% Animal husbandry income	37.16	28.50	31.87	
Farmers' own wealth classification (%)				
Poor (%)	5.66	5.75	5.71	1.28
Moderately well-off (%)	81.13	73.56	76.43	
Well-off (%)	13.21	20.69	17.86	
Social capital				
Information exchange with others (%)				
Yes	5.66	10.34	8.57	0.92
No	94.34	89.66	91.43	
Identification of people in the village (%)				
Hardworking-helpful	22.64	18.39	20.00	14.31*
Hardworking-envy	11.32	5.75	7.86	
Hardworking-mind one's business	11.32	18.39	15.71	
Normal-helpful	16.98	11.49	13.57	
Normal-envy	1.89	12.64	8.57	
Normal-mind one's business	18.87	6.90	11.43	
Lazy-helpful	1.89	5.75	4.29	
Lazy-envy	5.66	11.49	9.29	
Lazy-mind one's business	9.43	9.20	9.29	
Potential of the people doing business jointly in the village				
Yes/Perhaps	62.26	49.43	54.29	*Fish exact test Sig: 0.09
No	37.74	50.57	45.71	

*Statistically significant at the 90% confidence level, **statistically significant at the 95% confidence level, ***statistically significant at the 99% confidence level.

area, about 54% of producers interviewed in the DBL areas stated that their cooperativeness of the community was high. That ratio is higher in the home-garden-type production areas (62.26%), but lower in the field-type production ones (49.43%). This difference was found to be statistically significant (Table 4). It means that there is close relation to sustainability of PGR and cooperativeness of the farmers. A similar situation exists when people come together and work together in a society, and it is observed that, in general, there is a tendency of more than half of the population work together in DBL production areas (Table 4).

Discussion

Turkey is one of the rare countries in the world in terms of genetic diversity; local populations have been disappearing with time and they replace with varieties that are higher in yield. Many factors affect the disappearance of local populations and local populations are being produced to meet the needs of families. Nowadays loss of income due to low efficiency leads producers to generate improved varieties. Preservation of genetic resources, and ensuring their sustainability by maintaining the existing ones under both farmer's conditions (*in-situ*) and special fields like gene banks (*ex-situ*) has become one of the most important policies of the states. The existence of such local populations for biodiversity and enrichment of the gene pool is also important in terms of ecosystem health and technological progress. Significant progress in policy making in this regard has been achieved in Turkey; both *in situ* and *ex-situ* studies have been carried out in the direction of protection of PGR. The most important shortcoming in this regard is the lack of an adequate database of product-based production areas and

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cultivation conditions. For this reason, such studies are important both for updating the situation of the country on this issue and informing the policy makers about the measures to be taken in this regard.

In the absence of a gene centre, South-Eastern Anatolia and Samsun-Tokat-Amasya micro gene centres are the centres of genetic diversity for beans (Şehirali *et al.*, 2005). Numerous studies have been carried out in Turkey on the subject of both collection–evaluation and use in breeding of bean as a genetic resource (Sözen *et al.*, 2012). Thanks to the fertile Anatolian land in Turkey, which has hosted many civilizations and the ecological diversity of beans has caused variation to occur over many years, as in other plant species. Therefore, different kinds of regional bean varieties have emerged in different regions due to cultivation of the seeds that enter the country from different sources over many years in the growing regions. In the bean plant, there are locally grown and a large number of genetic materials that are different in characteristics (Karataş *et al.*, 2017). In the world and Turkey, despite the availability of varieties in common bean, many producers still produce and sell local bean genotypes/landraces (Toklu *et al.*, 2016). Therefore, in different regions of Turkey it is still possible to find local bean genotypes/landraces. Especially Middle Kızılırmak Valley that is close to the Samsun-Tokat-Amasya micro gene centres is an important centre for the richness of the local dry bean populations/landraces.

Although it is not the homeland of dry beans, dry beans agriculture in Turkey began after other edible legumes and it is estimated that its production has been started approximately 200 years ago (Aydoğan *et al.*, 2015). Such landraces do not go beyond hobbies in many places, and local green bean populations are harvested and consumed as dry beans. At the same time with the aim of cultivating based on local populations, studies on several vegetable species collected for breeding purposes are also frequently encountered and such studies are being carried out on beans in Turkey (Balkaya, 1999; Madakbaş *et al.*, 2006; Sözen *et al.*, 2012; Erdinç *et al.*, 2013).

Nowadays, it is seen that local varieties are mostly produced in places away from main centres. Generally, they are restricted to more remote, often mountainous regions that are not affected or far less affected by the general trend to more intensified agriculture (Fischbeck, 2003; Gauchan *et al.*, 2005; Kan *et al.*, 2015). These types of farms are generally of small scale and they cultivate their crops with traditional methods and cannot purchase modern machinery for cultivation (Naqvi *et al.*, 2016). The protection and sustainable production of such products are only possible if these products are used as a means of local development dynamics. Unfortunately, this type of crop is being produced in areas remote from the main centres (Kan *et al.*, 2016a). If we take the threshold of mountainous areas as 1200 m (Oğuz *et al.*, 2016) in the Center of Anatolia in Turkey, HGP type for DBL is more common than field-type DBL production. This type of place is generally underdeveloped in terms of economy.

Determining and putting forward capital structures of agricultural enterprises is the first step to create a policy recommendation on PGR. Capital assets (natural, physical, financial, human and social capitals), which are indicative of the wealth and welfare of agricultural enterprises, indicate their socio-economic structure of agricultural enterprises and are related to their decision making habits. There are many studies on decision of farmers on landrace production by using geographic location and different capital asset data of them (Gauchan *et al.*, 2005; Villa *et al.*, 2005; Kruzich and Meng, 2006; Kan *et al.*, 2016a). Field-type DBL-producing agricultural enterprises are better than the others in terms of capital assets. Field-type DBL-producing farms are more aware of market conditions and market conditions are more effective in production decisions. As a result of research, it has been determined that such enterprises have more natural and physical capital. In terms of financial capital, field-type DBL-producing farms mostly derive their income from agriculture, while the main source of income for other enterprises is the non-agricultural sector. While field-type DBL-producing farms give up more easily local varieties/landraces, other enterprises are more enthusiastic about the sustainability of PGR.

As can be seen from the DBL study, the production of such local populations is not based on commercial purposes. Therefore, it can be seen day by day that Turkey will face much problem with reduction of such productions. One of the main problems is that especially young farmers' unwillingness to deal with this type of production creates a negative pressure on the protection of genetic resources. About 67.86% of the producers in the region stated that they will continue to produce DBL. Home-garden-type agricultural enterprises are more eager than field-type producers in terms of sustainability of production, and this difference is statistically significant. In addition, 25.71% of DBL producers have expressed their opinion that their children will continue to produce beans. In both types of production, half of the producers said that their children will not produce DBL; and this points out the results that the elderly population continuing to habitually maintain genetic resources and the young population is not willing to produce these landraces. It is directly affecting the sustainability of PGR. Some studies in Turkey showed similar results. Kan *et al.* (2016a) determined that the average age of the household heads is over 50 years old in the enterprises producing wheat landrace in their study, and it is stated that the ageing of the household is a serious problem in the enterprises engaged in such production. And also in another study conducted by Birol *et al.* (2018) stated that the families (66% of the sample) who applied for Young

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Farmer Project Support in 2016, didn't want their children to engage with farm activity in future. It means that there is a tendency on families in the rural area of Turkey towards to out of agriculture sector for work and it will affect negatively conservation and sustainability of genetic resources.

Landraces are generally produced in small scale farms for home consumption. Especially, the landraces and local foods have been getting popular recently and consumers have started to prefer buying local food for health, safe, tasty, etc. reasons. This new consumer groups, interested in purchasing quality foods linked to traditional and environmentally friendly labels. This type of people is more concerned with the environmental and social impacts of food production, and they are rediscovering landraces as a source of value-added foods intrinsically associated with local production (Villa *et al.*, 2005). The production of local plant populations in villages has become popular and the efforts for healthy food consumption in Turkey are actually important in terms of conservation of PGR. The people of Turkey emphasize on the production and consumption of dry beans. In recent years, local populations, which are an important material in breeding studies as a genetic resource, are also a tool that can be used in rural development (Kan *et al.*, 2016b). Even in many regions, local dry bean populations have been identified with the area they are grown in and have started to be among our traditional varieties. The fact that our diversity is transformed into a culture in terms of dry bean products and that this culture is protected by different systems in the way of branding is important for preserving our genetic resources and creating added value in rural areas. One of the initiatives on that concept is a Geographical Indication (GI) system. There are many specific samples in Turkey protecting by the GI system such as İspir Dry Bean, Hınıs Dry Bean, Çameli Dry Bean, Akkuş Şeker Dry Bean, etc. (TURKPATENT, 2019). In the research region, this type of initiative can be used for local economic development tools by using DBL in both local economic and social development. Thereby, the development process opens a way for improvement in the capital assets of DBL-producing farms.

As a country, we should focus more on their maintenance under farmers' conditions (*in situ* conservation) and improve conservation and sustainability strategies using organic farming practices, geographical indications, mountainous production practices and emphasis on local products. We also need to increase public awareness on the importance of genetic resources and strategies for their valuation. Especially, it can be said that the landrace production is mostly adopted by the elderly population and that young people do not show much interest in these productions which will trigger the disappearance of these varieties in the future. For this reason, support and awareness of the young population about these productions require special policy tools.

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