



The Strategy of Utilize Unused Lands for Production Purposes in Turkey

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ABSTRACT

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The aim of this study is to discuss the feasibility of the strategy to utilize unused land for production purposes in Turkey and the effects of land resources in Turkey on the implementation of the strategy. An unused (unproductive) land is a land that reduces the quality in terms of components that define a land, causes adverse conditions to affect the land use, and is not utilized for agricultural purposes within a crop rotation period of time. Published in the Official Gazette No. 30224 of 10/28/2017 and put into effect, the Year 2018 Program reads: "The utilization of unused agricultural lands for production purposes shall create models for the effective operation of agricultural farms". In addition, the sub-paragraph 11 on Policies and Measures, which are set out under the title of 5th Growth and Employment Strategy as a part of the 2019-2021 Medium Term Program in accordance with the Presidential Decree No. 108 of 9/20/2018, reads: "Organizational and legal infrastructure shall be established to utilize unused agricultural lands for production purposes." From this perspective, there is a need to reform the unplanned land use and the forms of property and use as it is one of the agricultural infrastructure problems in Turkey. The importance of introducing a system to give a true picture of the market land of agricultural lands and making sure it is influenced less by other industries is self-evident. The land resources that Turkey currently has, challenges concerning those lands and agricultural structure make it difficult to execute the strategy. There are some major social, economic, legal and technical barriers to the achievement of the goals. This study offers recommendations on how to remove those barriers based on the figures of a study commissioned by the Ministry of Agriculture and Forestry, and analyses the unused agricultural lands in Turkey and the possibilities to utilize them for production purposes. Agricultural lands are utilized for non-agricultural purposes, and the studies on how to utilize unused agricultural lands with conditions that reduce the quality of lands in terms of components that define a land point to a contradiction between what is intended and what is actual. Without making any land use plans, it is impossible for effort to develop a land use strategy to be efficient.

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1. Introduction

From past to present, lands have been utilized by human beings based on their needs and priorities, particularly for nutritional and housing purposes. Such needs and priorities vary in line with ever-changing demands over time. The only constant is the efforts to analyze capabilities to utilize agricultural lands in a more effective and efficient way. Based on an estimation, the size of agricultural lands will only grow by 10% around the world over the next 75 years whereas the global population will double, and the majority of the population growth will be focused on semi-arid and arid zones of the world where salinization is highly common. This scenario shows how important the sustainable management of natural resources is (Fischer 2020). As the effects of human-induced climate change steadily grow and they pose environmental threats to an alarming extent, the efforts to eliminate them are built up across the globe on a daily basis (Ahmed et al., 2007)

Through the improvement of agricultural and social infrastructure services, the promotion of rural development and welfare, and enhancement of the attraction of rural areas, the Food and Agriculture Organization (FAO) of the United Nations is intended to improve the living conditions and incomes of individuals and communities that reside in rural areas and live on agriculture. This will diversify economic activities in rural areas based on local know-how and scientific projects, mitigate land fragmentation, introduce on-land development services and modern irrigation systems, and improve irrigation efficiency. This will also enable to make efficient use of domestic and international funds allocated to promote rural development, and prevent agricultural lands from being utilized for non-agricultural purposes, conserve and improve land and water resources. Decision makers and users will have an easy access to figures collected through an agricultural information system.

In addition, practices of land consolidation will gain momentum, and agricultural lands will not be fragmented by inheritance, and problematic agricultural lands will be located, and land improvement and drainage efforts will be expedited, and agricultural lands will be utilized for their original purposes based on land use plans (Zhou et al., 2020).

Just like it is the case in Turkey, natural resources in underdeveloped and developing countries are under pressure due to the misuse of

lands and unplanned land use, growing population, soil erosion in vulnerable ecosystems, multi-dimensional demands for scarce resources, a poor rural population, and shortage or lack of organizational aids.

Of them, the land use, which is not based on a certain plan, causes neighboring industries to conflict with one another in many aspects. Unplanned land use causes many ecological, social, economic and cultural problems such as soil being detached in a short while, floods as a result of excess surface runoff caused by soil detachment, replacement of valuable agricultural lands, settlements, dams and ports by soil detached, and hauling of soil on slopes and gradual reduction of soil thickness and emergence of bedrocks, loss of capacity for a land to retain and store water, and desertification namely formation of anthropogenic (man-made) dry lands, loss of habitats, increased rural poverty, rise in migration from rural to urban areas, and decline in visual value of lands. This causes degradation in natural resources and puts sustainable development at risk.

To eliminate such challenges, it is imperative to conclusively designate the lines of work for forestry, agriculture, pasture farming, settlements, industrial plants, transportation industry etc. based on bio-physical, social, economic, cultural and environmental variables, as they utilize lands, and predicate them on a land use plan and map. To be made based on scientific facts, this plan must meet demands, needs and expectations of the growing population, strike a balance for the conservation of current and future productivity of ecosystems, and thus provide a sustainable land use (Özartan 2013).

Land evaluation and land use plans must be based on make a rational analysis and assessment of prompt, accurate and sufficient information and data about soil and land resources based on modern technologies. Land evaluation is a type of estimation about the potential of a land for use. Land evaluation methods are usually divided into qualitative methods based on expertise and quantitative methods based on simulations (Permanandh 2011, Dengiz and Sarioglu 2013). In this context, rational land use should be adopted that brings economic and environmental sustainability, which will reduce conflicts over scarce resources (İban, 2019; Myers, 2018; Drucker, 2012).

Most of the agricultural farms in Turkey do not have a sufficient land area, and agricultural lands are highly fragmented and not cultivated in an

efficient way. The fact that farms do not have a sufficient size of lands increases transportation and shipping losses and costs for them. As a result, farmers cannot possibly attach due importance to their lands, fail to find an opportunity to utilize modern means and have capital accumulation. This makes it difficult to provide infrastructural services such as roads, utility water, drainage and leveling for such farms on fragmented lands and increases the cost, too (Allen et al., 1998).

The studies suggest that the arable land per capita was nearly 5 hectares in 1959, while it was almost cut in half in 2006, regressing to 2.5 hectares. It is estimated to regress further to 1.1 hectares by 2040. In addition, 2 to 5 million hectares of arable lands are being lost to erosion and/or drought for a variety of reasons.

Large-scale agricultural land lots are transferred by inheritance and they become smaller and smaller by each transfer and end up being non-arable from the economic standpoint. In fact, the number of agricultural farms amounted to 2.2 million and their land size was nearly 10 million hectares in Turkey back in 1950 while it regressed to 6 million hectares while the number of agricultural farms increased to over 3 million and the total size of agricultural lands went over 26 million hectares in 2001 after new agricultural lands were cleared for use. In addition to a sufficient size to engage in agriculture, soil productivity and health is of importance for production. 800 m² of fertile lands can provide 800 kg of foods needed annually per capita while it can take more than 1000 m² to provide the same amount of foods in unfertile lands (Nonhebel 2005).

The success of reforms to improve the agricultural structure in terms of eliminating problems caused by the misuse of agricultural lands depends on a comprehensive plan. Such improvements must be introduced in an effective way where all the plans are effectively made for the use and conservation of agricultural lands. Agricultural lands must be reformed and improved based on plans that attach primary importance to their agricultural functions, and natural habitats must be built and conserved as a part of a multi-dimensional program (Dengiz and Sarioğlu, 2013).

An overview of agricultural lands around the world

The Earth has a total land surface of approximately 15 billion hectares, and agricultural lands, which amount to 5 billion hectares,

constitute 37% of it. Based on the form of use of agricultural lands, field crops are grown on nearly 1.5 billion hectares of land while perennial plants are sown on 1.5 billion hectares of land (Ritchie and Roser, 2013). Nearly 45% of the world's population lives in families where agriculture is the primary income source (Bourguignon and Bussolo, 2013). At the same time, agriculture drives the economy of many developing countries. For this reason, the future of humanity depends on the sustainability of agricultural lands (Aznar-Sanchez et al., 2019). The allocation of natural land covers to land-use systems is an important dynamic of global environmental change affecting climate, hydrology, biodiversity and other world systems. However, on the global land surface; the continuous increase in infrastructures built to support people's material needs, such as residential, commercial, industrial, transportation and energy demands, also reflects the change in land uses. (Hansen et al., 2022). On the other hand, unsustainable use of lands and excessive consumption of natural resources due to climate change around the world can cause land degradation, drought, desertification, etc. posed problems (Yi et al., 2016; Tilman et al., 2011; Lambin and Meyfroidt, 2011). Losses of agricultural productivity and efficiency and global food crises adversely affect not only the agricultural business but also the global economy to a substantial extent. Climate change and growing world population force developed countries to lease fertile agricultural lands from Asian and African countries to meet their future needs for food.

Published by the Food and Agriculture Organization (FAO) of the United Nations, the World Agriculture: Towards 2010 indicates that there are potential lands as large as 1.8 billion hectares in addition to the aforementioned ones that can help increasing the size of agricultural lands in years to come. As noted in the aforementioned report, these lands, which can be utilized for agricultural purposes in years to come, are mostly located in Sub-Saharan Africa and South America. So much so that FAO estimates that the currently cultivated land should increase by 60 percent by 2050 to meet world food production. Global land cover data is presented in Figure 1.

Once the feasibility to expand agricultural lands around the world other than the aforementioned ones is analyzed, that it is highly limited and the size of agricultural lands in many countries

including Turkey has peaked. However, it is known that a significant portion of agricultural lands around the world becomes non-agricultural lands on grounds of erosion, salinization, extensive use and allocation of lands for other industries.

While the feasibility to expand agricultural lands is being discussed on one hand, the use of agricultural lands for non-agricultural purposes and land degradation pose more and more threats to global agriculture. In fact, overgrazing, deforestation, unfavorable agricultural activities and misuse of agricultural lands cause 26% of

global lands, which correspond to 1.2 billion hectares, to face the risk of degradation. On the other hand, the uncontrolled expansion of agricultural lands brings with it deforestation. As a result, the protection of biodiversity becomes a global threat (Kissinger et al., 2012). Due to the expansion practices in agricultural areas in the world, about three quarters of the forests have disappeared. This situation brings with it a decrease in the resistance of animal populations and other environmental effects (Maxwell et al., 2016; Baudron and Giller, 2014).

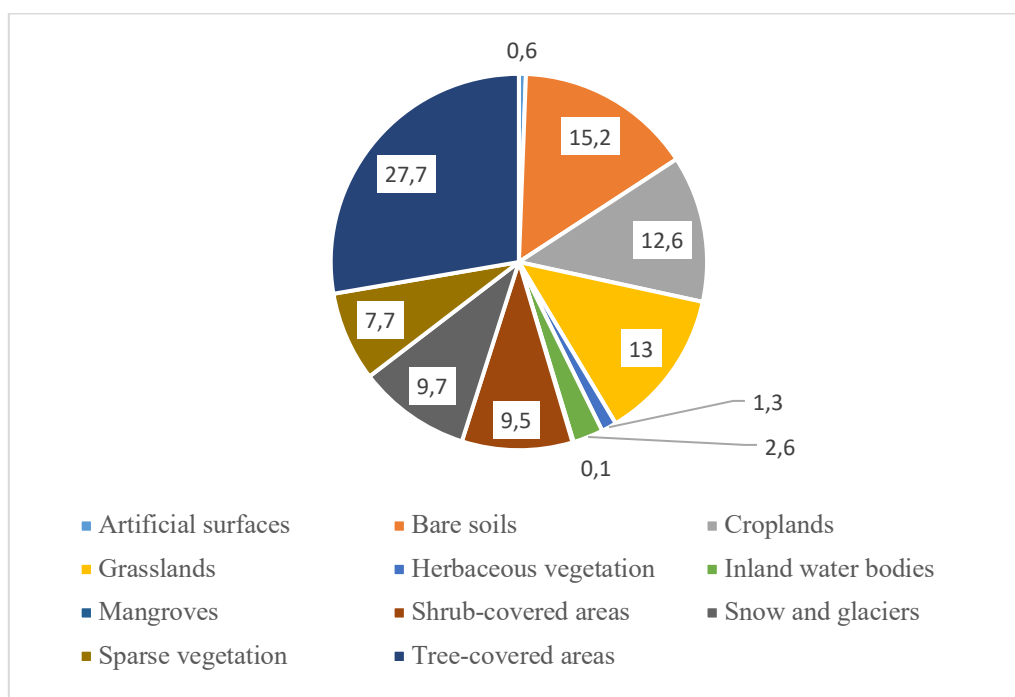


Figure 1. Global land cover layers according to FAO's new database.

As a part of the Global Assessment of Human-Induced Soil Degradation (GLASOD), the International Soil Reference and Information Center (ISRIC) reported that 15% of terrestrial lands have degraded to various extents as a result of human-induced activities. Of the lands, 55.7% have been degraded by water erosion, with 27.8% by wind erosion, 12.3% by chemical changes (loss of food, salinization, pollution and acidification) and 4.2% by physical changes (flood, compaction, subsidence) (Šarapatka et al., 2010). The global amount of soil detached is estimated to be 0.5 to 2 tons/ha/year while the amount of soil lost is 24 billion tons. The global population is expected to hit 9.3 billion by 2050, and the income per capita is expected to rise along with the growing population. It is estimated that income growth will increase protein demand and 45% of global agricultural lands, which correspond to 1.6 billion hectares, will serve to feed animals and produce feeds to meet the

protein demand (Bahar et al., 2020). It is a challenge for sustainable land management to balance agricultural production and nature protection in meeting these demands, which are expected to increase gradually, and to minimize negative interactions (Chaplin-Kramer et al., 2015; Grau et al., 2013). Arid and semi-arid lands constitute nearly 41% of the world's total land size (Qader et al., 2021). Approximately 50% of the lands irrigated and cultivated in these climatic zones suffer from salinization to various extents (Gengmao et al., 2015). More than 20% of irrigated agricultural lands both in Turkey and around the world have been facing hypersalinity due to over-irrigation. It is reported that the world is home to 954 million hectares of land affected by salinization and limited productivity. Such problematic lands cover 50.8 million hectares in Europe, 320 million hectares in Asia, and 4.2 million hectares in Turkey along with those with

moisture problem. Aridity and underlying problems manifest themselves and keep growing in many places. 1.5 million hectares of irrigable land per year are affected by salinization around the world.

All of the studies commissioned by international organizations refer to three main problems that must be addressed today in order to keep feeding the global population in 2050. They are as follows:

- Effective use of fresh water resources,
- Preservation of productivity in arable lands,
- Global warming and consequential drought that directly concern both water and soil.

As of 2016, 28 European Union member countries are home to 10.467,760 agricultural farms, and they cultivate 173.338,550 hectares of agricultural land. As for the share of EU member countries in total size of agricultural lands cultivated, France ranks first (16.05%). France is followed by Spain (13.40%), Germany (9.64%), the Great Britain (9.62%), Poland (8.31%), Italy (7.27%) and Romania (7.21%) respectively.

An overview of agricultural infrastructure and land use in Turkey

As it is home to diverse geological structures, climatic zones, vegetation and topographic characteristics, Turkey embodies most of the groups of soil that are widely common around the world. Coupled with various climatic conditions,

the aforementioned characteristics enable to grow a wide range of products in Turkey. In this context, agriculture has a key social and economic importance for Turkey. As a matter of fact, about half of Turkey's total land area is devoted to agriculture. At the same time, this area is above the EU average. Developed for various purposes, classification systems offer classification of soils and lands they are situated on, and various management systems for various production systems. Based on their characteristics that limit soil cultivation, lands are divided into eight classes, ranging from 1st class lands being non-problematic to 8th class lands being not suitable for plant production. Of 8 classes of lands, the first four classes are suitable for cultivation while the remaining four classes are lands that must be under permanent vegetation such as forests and pastures.

Once the extent of misuse of absolute and potential agricultural lands of provinces is analyzed based on types of land use, it is concluded that 1.59% of the total land size is suitable for agriculture and yet unused. These lands correspond to 3.08% in agricultural farms that have 20 to 49 decares of land (Figure 2).

Only 1.3% of the unutilized potentially productive land suitable for agriculture is irrigated land, and the remaining 98.7% is non irrigated land. The total size of misused agricultural lands is 2.239,467 hectares. Of them, nearly 1.9×10^6 hectares of agricultural land are recoverable.

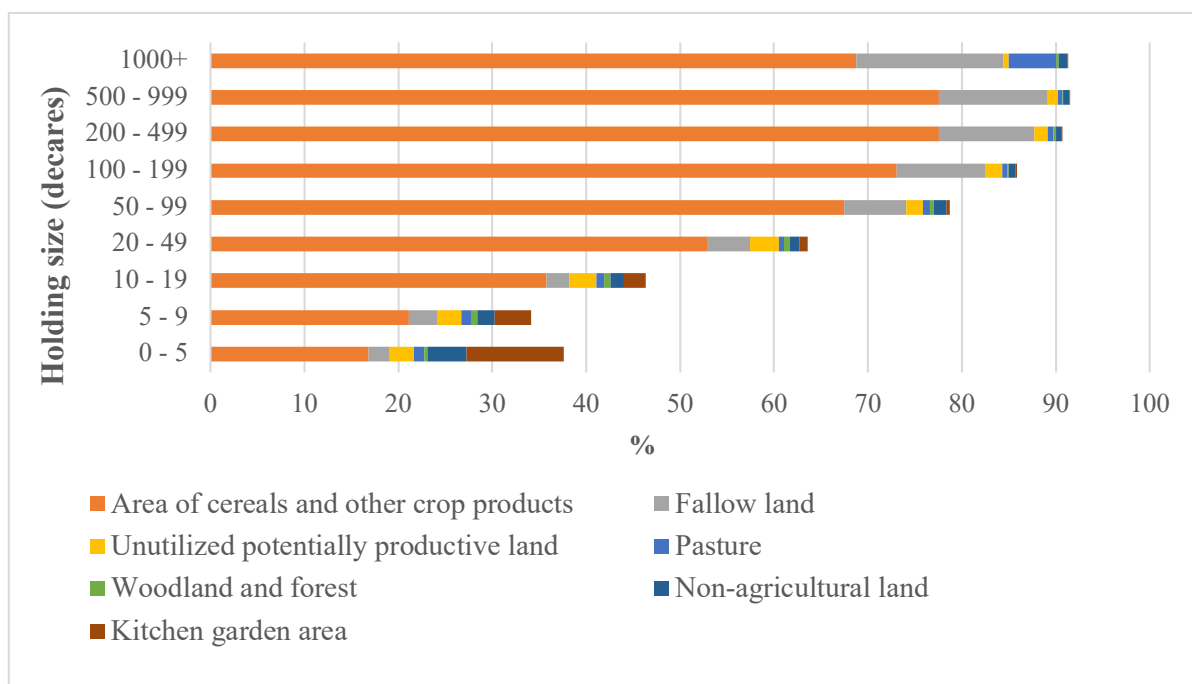


Figure 2. Distribution of land use by holding size, 2016.

The same applies to potential agricultural lands that are as large as nearly 2.5×10^6 hectares. However, how to use and turn them into agricultural lands can become clear only after nation-wide plans are made for land use. The total size of lands subjected to improper land use that caused a rise in erosion and a decline in productivity as a result of cultivated agriculture on lands not suitable for cultivated agriculture is 6.274,168 hectares. The 5th Land Use Capability Class is a particular class as it consists of lands that are not sloping, situated at bottom lands with common drainage problems, suffering from floods on a frequent basis, and having poor soil engineering qualities and being not suitable for settlements. However, in Turkey, class 5 lands cover an area of 4346 km² (Atalay, 2016). 14.279,4 hectares of pasture, which is part of the 7th land use capability class, require checking soil profile characteristics in the phase of land use planning, and allocating some of them for forestry (Kuşvuran et al., 2011; Doğan, 2011; Erol, 2007).

Agricultural lands in Turkey are fragmented, dispersed, small, jointly-owned and sloping. Cultivated agricultural lands make up 23.20 million hectares of 77.79 million hectares (projection size) of land resources in Turkey, and the agricultural structure is usually based on the ownership of lands by small-scale family farms. Upon the expansion of lands cultivated throughout the Republican Era, the number of farms has increased and the size of farms on average has risen to nearly 60 decaire. However,

this is far from the size that agricultural farms need to make a decent living. This is considerably smaller than the EU average (130 decaire.). Some measures were taken to preserve the average operational size of agricultural lands upon the introduction of reforms on land law back in 2014. With this being the case, the reforms to regulate and conserve agricultural lands have failed to improve land improvement and on-land development services to enable different geographical zones to engage in different agricultural cultivation activities, guide them and help them raise their scale as an economic enterprise, eliminate their problems and facilitate the use of agricultural lands (Anonymous, 2019). When it comes to percentile changes in the number of agricultural farms, the size of lands and scale of farms, some positive and negative changes have been introduced along with various practices of agricultural policy. The number of agricultural farms, changes by years and the size of agricultural lands they cultivate are presented in Table 1 based on the Turkish farmer registration system (Tanrivermis 2003).

The size of farms grew over the years whereas the growth could not suffice to change the product patterns, productivity and quality that would define an economic production. One can argue that the provision of on-land development services has a positive impact on the rates of change displayed on the table. Table 2 displays the applications lodged for non-agricultural use of agricultural lands and the number of permissions granted.

Table 1. Number of agricultural farms and size of agricultural lands they cultivate according to the farmer registration system

Years	Number of farms	Change in %	Size, da.	Change in %	Scale of farm, da.
2002	2.588.666	-	164.960.377,91	-	64
2003	2.765.287	6.82	167.346.718,45	1.45	61
2004	2.745.424	-0.72	167.009.179,55	-0.15	61
2005	2.679.737	-2.39	165.826.141,16	-0.76	62
2006	2.609.723	-2.61	164.930.261,03	-0.54	63
2007	2.613.234	0.13	167.277.814,28	1.42	64
2008	2.380.284	-8.91	157.694.645,10	-5.73	66
2009	2.328.731	-2.17	154.360.406,82	-2.11	66
2010	2.320.209	-0.37	151.027.250,78	-2.16	65
2011	2.288.366	-1.37	156.287.667,33	3.48	68
2012	2.214.390	-3.23	153.438.732,86	-1.82	69
2013	2.183.270	-1.41	147.293.244,06	-4.01	67
2014	2.206.874	1.08	149.276.892,42	1.35	68
2015	2.197.319	-0.43	148.004.195,82	-0.85	67
2016	2.267.176	3.18	147.858.630,89	-0.10	65
2017	2.132.759	-5.93	148.437.131,87	0.39	70
2018	2.152.003	0.90	151.629.382,44	2.15	70
2019	2.083.022	-0.63	149.294.823,22	1.01	72
2020	2.127.957	0.97	150.943.261,16	0.98	71
2021	2.171.748	0.98	152.456.506,38	0.99	70

*Collected from the figures of the Ministry of Agriculture and Forestry

Table 2. Applications and outcomes for non-agricultural use under the Law No. 5403

Years	Number of Applications	Size of Lands (ha)	Size of Lands Permitted (ha)	Size of Lands Denied (ha)	Rate of Permission (%)
1989-2001	24.491	2.386.531,08	1.488.877,87	897.653,21	62
2002-2005	15.189	671.449,54	435.150,02	236.299,52	65
2006-2018	98.736	1.306.133,06	679.481,35	626.651,71	52
2018-2021	13.164	845.432,98	516.184,17	412.265,58	61
Total	151.580	5.209.547,66	3.119.693,41	2.172.870,02	60

*Collected from the figures of the Ministry of Agriculture and Forestry

Based on the figures on the table, 24.491 applications were lodged from 1989 to 2001 in a span of 12 years, and 1.488,877,87 hectares of agricultural land became out of production upon a change in the nature of lands. Over the past 30 years, 60% of 151.580 applications for non-agricultural use were approved, and 3.119.693, 41 hectares of agricultural land became out of production. Urbanization, migration to regions where industry is developed, and the new dimension brought by newly established universities to urbanization can be counted among the reasons for being excluded from agricultural production. This situation has led to the transformation of agricultural lands, especially around big cities (Bayar 2018; Kepenek 2016)

Agricultural lands are utilized for non-agricultural purposes, and the studies over how to utilize unused agricultural lands with conditions that reduce the quality of lands in terms of components that define a land point to a contradiction between what is intended and what is actual. This contradiction should not prevent us from exerting efforts to make unused agricultural lands productive (Anonymous 2015). On the contrary, it is of utmost importance to turn the strategy of making effective use of agricultural

lands and conserving them into a sustainable format on one hand while running projects to utilize unused agricultural lands for production. Another factor affecting the change in agricultural areas is the socio-economic situation. As a matter of fact, the decrease in the economic inputs related to agriculture and the decrease in employment are also effective in the use of agricultural land. In particular, the share of the service sector in employment is increasing throughout the country (Figure 3).

The growth of the industry sector, accelerated the urbanization and accordingly, the service sector gradually grew. On the other hand, great activity is not observed in the agricultural sector. Considering that 12% of the immigrants in Turkey migrate to find a job, it is understood that the effect of employment is too great to be underestimated (TurkStat 2013). The change in agricultural areas also has an important relationship with the economic situation. While the share of agriculture in Gross Domestic Product (GDP) in Turkey was 10.0% in 2000, it decreased to 9.0% in 2010 and 6.7% in 2020. Considering all these situations, it is important to bring unused agricultural lands into the economy.

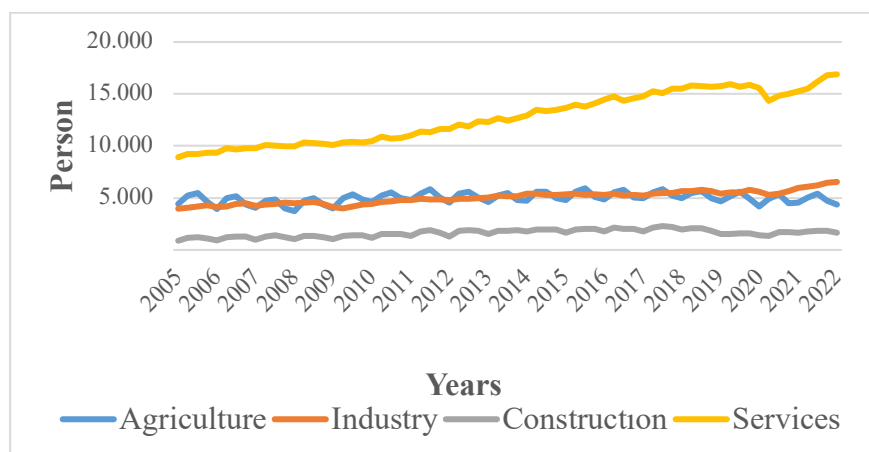


Figure 3. Employment by sector (2005-2022)

Available and unused agricultural lands

Soil; It is of vital importance within the ecosystem and land use boundaries for the sustainability of plant and animal production. The fact that soil, which is the most important production factor of agriculture, is a scarce resource that cannot be reproduced, also necessitates ensuring its sustainability. At the same time, unused lands should be evaluated according to their suitability for ecological safety purposes (Xiaoming and Hao.,2012). Agricultural lands must be utilized in a sustainable manner to provide people with reliable food supply, raise well-functioning generations as a safeguard of development, achieve rural development, improve the economy and create a habitable environment (Tahat et al., 2020; Nonhebel 2005). 23.5 million hectares of Turkey's total land assets consist of cultivated agricultural lands. In the last 10 years, there has been a decrease of approximately 1 million hectares in total arable land and land under permanent crops. As a matter of fact, it is predicted that the downward trend in agricultural areas will increasingly continue in the coming periods (Bayar, 2018).

As for the way agricultural lands are utilized in Turkey, 90% of them are cultivated on lands owned

by an individual. Apart from agricultural production, agricultural lands in Turkey are heavily used for urbanization, industry, tourism, mining, highways, dams, canals, etc., It is used in public investments and other areas of use (Karakuş et al., 2019).

While the rate of land use lease stood at approximately 1.5% for a long time, the number of farms that cultivated lands of 5 hectares and above for themselves and others significantly rose between 1991 and 2006. It can be concluded from the aforementioned rise that medium and large scale farms exponentially grew by operating the lands of small-scale farms in particular through other means of land use.

Once it is analyzed along with the aforementioned facts, one can argue that agricultural lands in Turkey are utilized to the utmost extent while there are problems concerning the land use due to the fact that agricultural lands are utilized for purposes other than land use capabilities. Therefore; Implementation of regulations that will reduce the pressure of non-agricultural use of agricultural lands is among the objectives of the development plans (DSB 2019).

Table 3 displays agricultural lands in Turkey based on the Land Use Capability Class (AKKS).

Table 3. Agricultural Lands in Turkey based on AKKS

Land Use Capability Class	Characteristics	Area Covered, ha.	Share in Total Size, %
I	Suitable for any type of agriculture and cultivation	5.086.084	6,5
II	Moderately suitable for cultivation	6.712.873	8,6
III	Limited suitability for cultivation	7.282.763	9,4
IV	Special product with special measure	7.425.045	9,5
Total		26.506.765	34,1
V	Uncultivated flat land with moist or rock tumuli	127.934	0,2
VI	Good pasture, good forest	10.825.762	13,9
VII	Degraded pasture, degraded forest	35.836.350	46,0
Total		46.790.046	60,1
VIII	Non-arable land	4.542.896	5,8
Total		77.839.707	100

Source: TOPRAKSU, Land Resources in Turkey, Ankara 1978; Ministry of Agriculture and Forestry, Annual Inventory, Ankara 2018.

Given the fact that the size of the first four classes of land has a 34.1 percent share in total size of lands based on the figures of AKKS, it is concluded that it is possible to engage in cultivated agriculture and perennial plant production on a land of nearly 26.5 million hectares across Turkey. However, 27.9 million hectares of land were

utilized for agricultural production from 1990 to 2011 (Anonymous 2015). The use of the soil in accordance with the skill classes is very important in terms of sustainability. However, the areas needed by the sectors with high profitability (industry, housing, tourism, etc.) in Turkey are evaluated without considering the land use

capability classes. As a matter of fact, the areas where the misuse of agricultural lands are most common are in the form of public investments for industry, urbanization and tourism, respectively (Karakuş et al., 2019; Akci et al., 2016; Yılmaz 2001). There is no study that covers the entire country about the inventory of agricultural lands that remain unused for a variety of reasons. However, the lands registered for production and the size of lands utilized for non-production purposes are calculated based on the farmer registration system (ÇKS), and it corresponds to 2 million hectares on average in consideration of differences in rates of change per year. The number and size of lots and the size of agricultural lands per farm are few for agricultural farms. The size of the lands that agricultural farms own had almost always been below 7 hectares. The initiative to utilize unused agricultural lands for production is a token of the fact that there is no other land to utilize for agricultural production and that this is the peak for land use.

As it is evident, the average size of farms is small and the land distribution is unbalanced in Turkey where small-scale agricultural farms are common. However, land fragmentation continues to be an exponential problem.

4. Conclusion

The fact that agricultural lands have been fragmented, dispersed and jointly owned since the proclamation of the Republic has created complicated challenges that are difficult to overcome. In addition, property and inheritance problems, misuse, erosion, salinization and unearned income generation on lands have made agricultural lands face the risk of a rapid extinction. Rural people mostly live on a variety of products and services made out of forests, agricultural lands and pastures. Therefore, it is of importance to make plans for the optimal spatial allocation of rural lands and manage them based on such plans. This is the only way to make effective and efficient use of land resources and promote rural development.

There is a need to legally and technically reform all procedures concerning the property and usage forms of agricultural lands, consolidation and on-land development services and agricultural lands.

It is a pressing need to establish a legal basis for a new organization to make an inventory of agricultural lands and engage in specialization efforts. Making a well-functioning inventory of

unused agricultural lands must be the primary task of such an organization. Making such an inventory will shed light on the possibility to utilize such lands for agricultural production.

Actions must be taken to integrate unused agricultural lands into infrastructural initiatives and rural development projects, and exemplary projects must be introduced to local authorities to raise awareness about land use and protection measures. Decisions about how to utilize unused agricultural lands for production cannot be taken solely based on final reports of some workshops, and legal initiatives must be taken in a way to cover all agricultural lands in a participatory, multi-sector, multi-dimensional, multi-purpose and multi-criterion manner based on social (including demands of various industries), economic, environmental and cultural factors. As agricultural lands, which are situated around settlements, rise in value after being turned into land lots, it is more and more difficult to keep utilizing agricultural lands for production purposes. In order to stop the allocation of fertile lands for non-agricultural purposes, there must be unity and resoluteness for the protection of fertile agricultural lands, and instruments to achieve those goals must be selected in a consistent manner. It is also essential to make a thorough analysis and map out all existing agricultural lands and make land use plans accordingly. To do so, an organizational structure must be established to attach priority to agricultural development based on rural development, and land market regulations and biodiversity conservation. Steps to make an inventory of unused agricultural lands, eliminate setbacks arising from ownership and usage, and turn agricultural lands into means of production through lease, sales or merger must be promptly taken.

Based on land use planning and consistency in practice, a strategy must be adopted to attach priority to environmental sustainability, biodiversity, food supply and security that would prevent all lands and especially agricultural lands from being unused. Making land use plans and creating a soil database through soil analyses, setting clear-cut roles and responsibilities for ministries, public agencies and organizations about land management and use, and establishing a robust organizational structure for agricultural land management at the central and rural scale must be taken into consideration. The adoption of right policies for sustainable use of scarce land resources and agricultural lands depleted by erosion, quickly

perished by non-agricultural use, polluted and degraded will not only enhance the success of development programs but also introduce a system to prevent lands suitable for agricultural production from being used for non-agricultural purposes in a way more effective than ever.

Sustainable agricultural production can be handed down to the next generations only if it is utilized in the most efficient way without causing means of production to be depleted and degraded.

A strategy to be adopted by Turkey to utilize unused agricultural land for production purposes will be beneficial to generate production value and protect agricultural lands in terms of its contribution to the aforementioned outcomes.

Competing interests

The authors declare no competing interests.

Competing interests

The data that support the findings of this study are available on request from the corresponding author.

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