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The Link Between Sustainable Development Goals and Agricultural Production Systems: Türkiye Analysis

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ABSTRACT

Technological developments are taking place at an incredible pace in the world and in Türkiye. As with all other sectors, the agricultural sector and therefore agricultural production systems are also affected by this process very quickly. Smart agricultural applications, artificial intelligence technologies, fertilization and spraying with drones, electric agricultural equipment, autonomous systems are among the main concepts and topics that are discussed and applied in the public. However, it is crucial to address these technological advancements within the framework of sustainability and ensure the balanced use of limited natural resources. This study aims to explore the relationship between the Sustainable Development Goals (SDGs) and agricultural systems in Türkiye, offering a fresh perspective on this crucial area. By utilizing the "Food Systems Summit Analysis" data tool from the FAO Data Laboratory, the study evaluates Türkiye's performance in achieving the SDGs. The findings reveal that while Türkiye has made significant progress in certain areas, substantial challenges persist in achieving sustainable agricultural production systems. The study contributes to the literature in two key ways. First, it identifies Türkiye's policy priorities and areas of success in transforming its agricultural systems within the SDG framework. Second, it develops a novel analytical framework to assess the interaction between sustainability and agricultural systems. This approach not only provides a roadmap for Türkiye but also serves as a valuable reference for other countries with similar development and sustainability objectives.

1. INTRODUCTION

Especially in the last 20 years, there have been significant changes and transformation processes in agricultural production systems as well as in all sectoral ecosystems. While this rapid change process is taking place, the concepts of efficiency and optimization are on the agenda as much as possible, and it is accepted by all segments that preventing the exploitation of existing natural resources worldwide and achieving balanced and sustainable development goals are now among the main policy targets.

Sufficient and balanced nutrition of the world population within the scope of the Sustainable Development Goals is one of the most important issues. In order to develop appropriate policy instruments to establish food security on a global scale, a good understanding of all motivational tools is necessary (Van Dijk et al., 2021).

Schneider et al. (2023) analyzed a food system indicator framework and holistic monitoring architecture developed to track food system transformation towards health, global development, and sustainability goals. The study focused on five main axes: (1) diets, nutrition and health; (2) environment, natural resources and production; (3) livelihoods, poverty and equity; (4) governance; and (5) resilience. Each main axis is divided into three to five indicator areas, and the indicators were selected to reflect each area through a good evaluation process. A total of 50 indicators were selected, with at least one indicator in each area. The data comprising these 50 indicators attempted to provide a basic assessment of the world food systems. As a result, while positive findings were obtained in some parts of each country's food systems, it was determined that no country had the highest values in all areas. In addition, it is claimed that some indicators are independent of national income, and that each of the indicators emphasizes a healthy, sustainable and equitable aspiration.

There are many activities and tests that may result in the damage and destruction of the multidimensional vital resources of the world, where living life continues, in the development and development process. Such negative activities can occur intentionally or unintentionally. For this reason, it is stated that there are many measures that need to be taken in order to prepare the planet for the future and to guarantee sustainable results in agriculture-food systems, and these should be taken quickly. In this context, the Food and Agriculture Organization (FAO) Strategic Framework 2022-31 has been developed. This process has been increasingly developed during the many negativities caused by the COVID-19 pandemic, and a global crisis that has been experienced worldwide and is thought to continue, although its intensity has decreased, FAO has the main mission of developing policies to establish functioning and sustainable agriculture-food systems that allow for sufficient and balanced food production and consumption (FAO, 2024a).

When the Covid-19 pandemic began to shake the world deeply in 2020, it became clear that non-traditional data sources and new methods that could improve coverage and provide rapid insights into specific issues were essential. On the other hand, there were already some efforts in this direction. For example, at the end of 2019, the Food and Agriculture Organization of the United Nations (FAO) established the "Data Lab for Statistical Innovation" with the aim of modernizing the Organization's statistical data collection and classification work, finding ways to fill and improve official data gaps. This can be explained as improving the timing and level of detail of data collection, providing automated analysis, and capturing early warning signals. The Covid-19 process has somehow accelerated the transformation and made efforts to do so even more prioritized (Fabi et al., 2022).

FAO's Data Laboratory was used in this study (FAO, 2024b). The Data Lab for Statistical Innovation employs cutting-edge methodologies to uncover hitherto undiscovered information pertinent to food security, nutrition, and food systems transformation. By extracting data from non-conventional sources and combining it with cutting-edge technologies, including web scraping, text mining, geo-spatial data analysis, and artificial intelligence, we address gaps in official statistics. Furthermore, we construct and sustain diverse databases to furnish timely, potentially real-time, data obtained from unconventional sources, thereby facilitating data analysis and evidence-based policymaking.

Türkiye has implemented various policies and practices to support the transformation of sustainable agriculture and food systems. These efforts are aligned with FAO’s 2022–2031 Strategic Framework and the Sustainable Development Goals (SDGs). For instance, support has been provided for organic

farming and good agricultural practices in Türkiye (Türkan and Gürçam, 2020), and the Soil Protection and Land Use Law, enacted in 2005, has legally secured the protection of agricultural lands (Resmi Gazete, 2005). To promote the efficient use of water resources, modern irrigation methods such as drip and sprinkler irrigation have been encouraged, alongside the development of integrated management plans (TOB, 2021). The "Save Your Food" campaign, launched in collaboration with FAO to reduce food waste, has raised awareness and contributed to the development of logistics and cold chain infrastructure to prevent product losses (TOB, 2024a). Digital tools such as the Agricultural Monitoring and Information System (TARBİL) and the Geographic Information System (GIS) are employed to enhance agricultural planning and productivity (TOB, 2024b). Additionally, IPARD funds have been utilized to support rural development, while projects targeting women farmers have contributed to gender equality (TOB, 2024c). To adopt a climate-resilient agricultural production model, the use of renewable energy sources, particularly solar energy, in agriculture has been encouraged (İDB, 2024).

These policies reflect Türkiye's efforts to strengthen sustainable agriculture and food systems in alignment with the SDGs. However, there is a notable lack of comprehensive academic studies evaluating the effectiveness of such direct and indirect policies in achieving the desired SDG targets. This study examines the transformation of agriculture and food systems in Türkiye within the framework of the Sustainable Development Goals. Given the limited number of holistic studies addressing sustainability indicators in Türkiye, this research aims to fill a significant gap and is expected to serve as a crucial guide and reference for future studies.

2. MATERIAL and METHOD

The study was mainly created by using the "Food Systems Summit Analysis" data tool in the "Analysis of Documents" menu in the FAO Data Laboratory section. The data sources used by the FAO Data Lab are derived from internationally recognized institutions and reliable databases. For instance, FAO's own datasets, such as FAOSTAT, have long been a standard source of information on agriculture, food security, and environmental sustainability. The database used in this study was developed during the UN Food Systems Summit (FSS), held as part of the UN General Assembly in September 2021, which set the context for the global transformation of agricultural and food systems to achieve the SDGs. A total of 1643 country dialogues were reported during the Summit, with more than 109000 participants. This resulted in the formulation of 117 National Pathways, which aimed to define the agri-food system transformations needed at the country level. The Data Lab employed text mining tools to extract, summarize, organize, and categorize information on effective policy interventions proposed in these transformation pathways. This in-depth analysis aimed to identify the current priorities that countries have defined as the pillars of their food systems transformation and to identify commonalities across country programs (FAO, 2024b).

The UN Food Systems Summit (FSS), which took place during the UN General Assembly in September 2021, created an important building block for global agri-food systems transformation to achieve the Sustainable Development Goals. During the Summit, 1643 country dialogues were reported with more than 109000 participants, resulting in more than 117 National Pathways. The purpose of these dialogues is to identify the agri-food system transformations needed at country level. The Data Lab used text mining tools to extract, summarize, organize and categorize information on effective policy interventions proposed in these transformation pathways in order to highlight existing priorities that countries have identified as the foundations for food systems transformations. Mainly, text mining tools were used to classify policy documents and gain insights into Türkiye's current priorities and programs related to agri-food system transformations (FAO, 2024b).

In addition, the Sustainable Development Report website was also used in detail and data was extracted (SDR, 2024). Sustainable Development Goals consist of 17 indicators. (i) No poverty (ii) Zero hunger (iii) Good health and well-being (iv) Quality education (v) Gender equality (vi) Clean water and sanitation (vii) Affordable and clean energy (viii) Decent work and economic growth (ix) Industry, innovation and infrastructure (x) Reduced inequalities (xi) Sustainable cities and communities (xii) Responsible consumption and production (xiii) Climate action (xiv) Life below water (xv) Life on land (xvi) Peace, justice and strong institutions (xvii) Partnerships for the goals. The values and success status of the indicators are represented.

3. RESULTS and DISCUSSIONS

Basically, within the framework of the SDGs in Türkiye, within the scope of pathway analysis, studies are carried out under 42 topics in 5 main areas. The distribution of these is presented below. The first action area, "Nourish All People," aims to ensure that all segments of society benefit from sufficient, healthy, and sustainable food systems. In this context, themes such as social protection mechanisms, reducing food loss and waste, supporting family farming, and promoting healthy diets for children are highlighted. The second action area, "Boost Nature-Based Solutions," focuses on minimizing the adverse environmental impacts of agricultural production. This area emphasizes themes such as nature-positive innovations, sustainable production methods, agroecological practices, soil health, and efficient water management. The third action area, "Advance Equitable Livelihoods and Empowered Communities," focuses on promoting social equity in agricultural systems and improving the economic and social conditions of disadvantaged groups. This includes increasing the participation of women and youth in the agricultural sector, ensuring fair income opportunities, and fostering rural development. The fourth action area, "Build Resilient Food Systems," aims to make agriculture and food systems more resistant to climate change, health crises, and other environmental or economic shocks. Key themes here include resilient supply chains and climate- and disaster-resilient development pathways. The fifth and final action area, "Means of Implementation," encompasses the supporting mechanisms necessary for implementing sustainable food systems. These include governance, financing, innovative knowledge and technologies, policy regulations, and infrastructure investments (Table 1).

Table 1. Action area and themes based using pathway analysis in Türkiye

Action area	Theme
1: Nourish All People	Social Protection for Food Systems Transformation Food Loss and Waste Family Farming Achieving Zero Hunger Healthy Diets from Sustainable Food Systems for Children & All Food Quality and Safety The True Value of Food Sustainable Consumption Social Protection for Food Systems Transformation Food Loss and Waste
2: Boost Nature-Based Solutions of Production	Nature-Positive Innovation Land Halting Deforestation & Conversion from Agricultural Commodities Water Sustainable Productivity Growth Agrobiodiversity Agroecology Sustainable Livestock Soil Health
3: Advance Equitable Livelihoods and Decent Work and Empowered Communities	Vulnerable Peoples Food Systems Urban Food Systems Youth Food Systems Equitable Livelihoods Food Systems for Women and Girls Decent Work and Living Incomes and Wages for All Food Systems Workers Indigenous Peoples Food Systems
4: Build Resilience to Vulnerabilities and Shocks and Stresses	Resilience to Stress and Vulnerabilities Resilient Food Supply Chains Resilience to Health Crises Resilience to Shocks and Violent Conflicts and Food Crisis Climate and Disasters Resilient Development Pathways (CRDP)
5: Means of Implementation	Governance for Sustainable Food Systems Finance and Investment Human Rights Policy and Regulation Digital Trade

	Human Resource Capacities
	Innovation and Knowledge
	Public Information
	Partnerships
	Better Data
	Infrastructure

Source: FAO, 2024b.

At this stage of the study, it was attempted to determine the extent to which the sub-indicators determined within the scope of SDGs were complied with. By evaluating the contributions of these success indicators to the SDGs as a whole, it was attempted to reveal the possible contributions and effects of these related indicators and communications on the transformation of agricultural production systems in Türkiye (Table 2).

When examining areas of success, notable achievements are observed in reducing poverty, access to clean drinking water, and indicators related to childhood nutrition. Under SDG 1 (No Poverty), the rate of extreme poverty has dropped to remarkably low levels. The reduction of the population living on less than $2.15 per day to a minimal level highlights the effectiveness of Türkiye's policies in this area. Similarly, under SDG 2 (Zero Hunger), the prevalence of stunting in children has decreased to a low rate of 5.5%, reflecting the success of Türkiye's nutrition programs. Access to clean water and sanitation services under SDG 6 (Clean Water and Sanitation) remains high, exceeding 97%, which is above global averages. These indicators showcase the progress Türkiye has made in social and basic infrastructure services (Table 2).

However, some areas of underperformance pose significant challenges to achieving sustainable development goals. Under SDG 13 (Climate Action), the per capita carbon emissions stand at a high level of 5.28 tons, indicating the need for Türkiye to adopt stronger sustainability policies in its energy and agricultural production systems. Similarly, SDG 15 (Life on Land) indicators reveal serious deficiencies in protecting biodiversity and ensuring the sustainable use of terrestrial ecosystems. Additionally, under SDG 12 (Responsible Consumption and Production), limited progress has been observed in waste management and recycling practices. These indicators emphasize the need for comprehensive policies to achieve environmental sustainability goals (Table 2).

In certain areas, mixed results are observed. For instance, under SDG 3 (Good Health and Well-being), Türkiye has made notable progress in general health indicators, but obesity rates remain high at 32.1%. This underscores the need for health policies that incorporate both preventive and curative approaches. In the context of SDG 5 (Gender Equality), significant issues persist, such as the low representation of women in parliament (17.33%) and disparities in female labor force participation. These findings highlight the necessity of addressing gender equality policies comprehensively (Table 2).

Table 2. Achievement of indicators of Sustainable Development Goals in Türkiye

Sustainable Development Goals	Value	Calculated by	Year	Achievement of SDG
SDG 1. No poverty				Challenges remain, on track or maintaining SDG achievement
-Poverty headcount ratio at $2,15/day	0.76	2017 PPP*, %	2023	Achieved, on track or maintaining SDG achievement
-Poverty headcount ratio at $3,65/day	1.39	2017 PPP*, %	2023	Achieved, on track or maintaining SDG achievement
-Poverty rate after taxes and transfers	15.00	%	2019	Significant challenges remain, on track or maintaining SDG achievement
SDG 2. Zero hunger				Significant challenges remain, score stagnating or increasing at less than 50% of required rate
-Prevalence of undernourishment	2.20	%	2020	Achieved, on track or maintaining SDG achievement
-Prevalence of stunting in children under 5 years of age	5.50	%	2022	Achieved, on track or maintaining SDG achievement
-Prevalence of wasting in children under 5 years of age	1.70	%	2018	Achieved, trend information unavailable
-Prevalence of obesity, BMI** ≥ 30	32.10	% of adult population	2016	Major challenges remain, score decreasing
-Human Trophic Level	2.25	best 2-3 words	2017	Challenges remain, score moderately improving, insufficient to attain goal
-Cereal yield	2.92	tonnes per hectare of harvested land	2021	Achieved, score stagnating or increasing at less than 50% of required rate
-Sustainable Nitrogen Management Index	0.64	best 0-1.41 worst	2018	Significant challenges remain, score decreasing
-Yield gap closure	Unavailable	% of potential yield	Unavailable	Information unavailable, trend information unavailable
-Exports of hazardous pesticides	3.80	tonnes per million population	2020	Challenges remain, trend information unavailable
SDG 3. Good health and well-being				Significant challenges remain, score moderately improving, insufficient to attain goal
-Maternal mortality rate	17.33	per 100000 live births	2020	Achieved, on track or maintaining SDG achievement
-Neonatal mortality rate	4.72	per 1000 live births	2021	Achieved, on track or maintaining SDG achievement
-Mortality rate, under-5	8.98	per 1000 live births	2021	Achieved, on track or maintaining SDG achievement
-Incidence of tuberculosis	18.00	per 100000 population	2021	Challenges remain, score stagnating or increasing at less than 50% of required rate
-New HIV infections	Unavailable	per 1000 uninfected population	Unavailable	Information unavailable, trend information unavailable
-Age standardized death rate due to cardiovascular disease, cancer, diabetes, or chronic respiratory disease in adults aged 30-70 years	15.63	%	2019	Challenges remain, on track or maintaining SDG achievement
-Age standardized death rate attributable to household air pollution and ambient air pollution	45.50	per 100000 population	2019	Challenges remain, trend information unavailable
-Traffic deaths	6.68	per 100000 population	2019	Achieved, on track or maintaining SDG achievement
-Life expectancy at birth	78.62	years	2019	Challenges remain, on track or maintaining SDG achievement
-Adolescent fertility rate	14.70	births per 1000 females aged 15 to 19	2020	Achieved, on track or maintaining SDG achievement
-Births attended by skilled health personnel	97.00	%	2019	Challenges remain, score decreasing
-Surviving infants who received 2 WHO-recommended vaccines	95.00	%	2021	Achieved, score stagnating or increasing at less than 50% of required rate
-Universal health coverage (UHC) index of service coverage	79.00	worst 0-100 best	2019	Challenges remain, on track or maintaining SDG achievement

-Subjective well-being	5.10	average ladder score, worst 0-10 best	2022	Significant challenges remain, score decreasing
-Gap in life expectancy at birth among regions	4.50	years	2019	Challenges remain, on track or maintaining SDG achievement
-Gap in self-reported health status by income	8.10	percentage points	2020	Achieved, on track or maintaining SDG achievement
-Daily smokers	28.00	% of population aged 15 and over	2019	Significant challenges remain, score decreasing
SDG 4. Quality education				Significant challenges remain, on track or maintaining SDG achievement
-Participation rate in pre-primary organized learning	79.49	% of children aged 4 to 16	2020	Significant challenges remain, on track or maintaining SDG achievement
-Net primary enrollment rate	95.11	%	2020	Challenges remain, score stagnating or increasing at less than 50% of required rate
-Lower secondary completion rate	122.52	%	2020	Achieved, on track or maintaining SDG achievement
-Literacy rate	99.91	% of population aged 15 to 24	2019	Achieved, on track or maintaining SDG achievement
-Tertiary educational attainment	39.83	% of population aged 25 to 34	2021	Challenges remain, on track or maintaining SDG achievement
-PISA*** score	462.67	worst 0-600 best	2018	Challenges remain, on track or maintaining SDG achievement
-Variance in science performance explained by socio-economic status	10.99	%	2018	Challenges remain, score decreasing
-Underachievers in science	25.15	% of-15-year-olds	2018	Significant changes remain, on track or maintaining SDG achievement
SDG 5. Gender equality				Major challenges remain, score stagnating or increasing at less than 50% required rate
-Demand for family planning satisfied by modern methods	60.20	% of females aged by 15 to 49	2018	Significant changes remain, trend information unavailable
-Ratio of female-to-male mean years of education received	83.62	%	2021	Significant changes remain, score stagnating or increasing at less than 50% required rate
-Ratio of female-to-male labor force participation rate	48.04	%	2022	Major challenges remain, score stagnating or increasing at less than 50% required rate
-Seats held by women in national parliament	17.33	%	2021	Major challenges remain, score stagnating or increasing at less than 50% required rate
-Gender wage gap	9.98	% of male median wage	2018	Challenges remain, trend information unavailable
SDG 6. Clean water and sanitation				Significant challenges remain, score moderately improving, insufficient to attain goal
-Population using at least basic drinking water services	97.01	%	2020	Challenges remain, on track or maintaining SDG achievement
-Population using at least basic sanitation services	99.23	%	2020	Achieved, on track or maintaining SDG achievement
-Freshwater withdrawal	45.71	% of available freshwater resources	2019	Challenges remain, trend information unavailable
-Anthropogenic wastewater that receives treatment	30.53	%	2020	Significant challenges remain, trend information unavailable
-Scarce water consumption embodied in imports	974.31	m_3 H_20 eq/capita	2018	Achieved, trend information unavailable
-Population using safely managed water services	Unavailable	%	Unavailable	Information unavailable, trend information unavailable
-Population using safely managed sanitation services	78.43	%	2020	Challenges remain, score moderately improving, insufficient to attain goal
SDG 7. Affordable and clean energy				Challenges remain, score moderately improving, insufficient to attain goal
-Population with access to electricity	100.00	%	2020	Achieved, on track or maintaining SDG achievement
-Population with access to clean fuels and technology for cooking	95.20	%	2020	Achieved, on track or maintaining SDG achievement
-CO_2 emissions from fuel combustion per total electricity output	Unavailable	$MtCO_2$/TWh	Unavailable	Information unavailable, trend information unavailable
-Renewable energy share in total final energy consumption	14.10	%	2019	Significant challenges remain, score stagnating or increasing at less than 50% of required rate

SDG 8. Decent work and economic growth				Major challenges remain, score stagnating or increasing at less than 50% of required rate
-Adjusted GDP**** growth	-0.59	%	2021	Challenges remain, trend information unavailable
-Victims of modern slavery	6.50	per 1000 population	2018	Challenges remain, trend information unavailable
-Adults with an account at a bank or other financial institution or with a mobile-money-service provider	74.09	% of population aged 15 or over	2021	Challenges remain, on track or maintaining SDG achievement
-Unemployment rate	Unavailable	% of total labor force, ages 15+	Unavailable	Information unavailable
-Fundamental labor rights are effectively guaranteed	0.41	worst 0-1 best	2021	Major challenges remain, score decreasing
-Fatal work-related accidents embodied in imports	0.05	per 100000 population	2018	Achieved, on track or maintaining SDG achievement
-Victims of modern slavery embodied in imports	20.11	per 100000 population	2018	Challenges remain, trend information unavailable
-Employment-to-population ratio	50.25	%	2021	Significant challenges remain, score stagnating or increasing at less than 50% of required rate
-Youth not in employment, education or training (NEET)	28.69	% of population aged 15 to 29	2021	Major challenges remain, score stagnating or increasing at less than 50% of required rate
SDG 9. Industry, innovation and infrastructure				Major challenges remain, score moderately improving, insufficient to attain goal
-Rural population with access to all-season roads	95.87	%	2022	Achieved, trend information unavailable
-Population using the internet	81.41	%	2021	Achieved, on track or maintaining SDG achievement
-Mobile broadband subscriptions	82.61	per 100 population	2021	Achieved, on track or maintaining SDG achievement
-Logistics Performance Index: Quality of trade and transport-related infrastructure	3.21	worst 1-5 best	2018	Achieved, score stagnating or increasing at less than 50% of required rate
-The Times Higher Education Universities Ranking: Average score of top 3 universities	40.45	worst 0-100 best	2022	Achieved, trend information unavailable
-Articles published in academic journals	0.74	per 1000 population	2021	Achieved, on track or maintaining SDG achievement
-Expenditure on research and development	1.09	% of GDP	2020	Significant challenges remain, on track or maintaining SDG achievement
-Researchers	5.65	per 1000 employed population	2020	Major challenges remain, on track or maintaining SDG achievement
-Triadic patent families filed	0.77	per million population	2020	Major challenges remain, score stagnating or increasing at less than 50% of required rate
-Gap in internet access by income	Unavailable	percentage points	Unavailable	Information unavailable, trend information unavailable
-Female share of graduates from STEM fields at the tertiary level	34.69	%	2014	Achieved, trend information unavailable
SDG 10. Reduced inequalities				Major challenges remain, score stagnating or increasing at less than 50% of required rate
-Gini coefficient	41.90	-	2019	Major challenges remain, score stagnating or increasing at less than 50% of required rate
-Palma ratio	2.01	-	2019	Major challenges remain, score decreasing
-Elderly poverty rate	13.70	% of population aged 66 or over	2019	Challenges remain, on track or maintaining SDG achievement
SDG 11. Sustainable cities and communities				Significant challenges remain, score stagnating or increasing at less than 50% of required rate
-Proportion of urban population living in slums	14.13	%	2018	Challenges remain, trend information unavailable
-Annual mean concentration of particulate matter of less than 2.5 micron in diameter (PM 2.5)	45.21	$\mu g/m^3$	2019	Major challenges remain, score stagnating or increasing at less than 50% of required rate

-Access to improved water source, piped	98.26	% of urban population	2020	Achieved, on track or maintaining SDG achievement
-Satisfaction with public transport	53.00	%	2022	Significant challenges remain, score decreasing
-Population with rent overburden	Unavailable	%	Unavailable	Information unavailable, trend information unavailable
-Proportion of population with access to points of interest with a 15 min walk	74.74	%	2022	Challenges remain, trend information unavailable
SDG 12. Responsible consumption and production				Significant challenges remain, score moderately improving, insufficient to attain goal
-Municipal solid waste	Unavailable	kg/capita/day	Unavailable	Information unavailable, trend information unavailable
-Electronic waste	10.20	kg/capita	2019	Major challenges remain, trend information unavailable
-Production-based SO_2 emissions	15.10	kg/capita	2018	Achieved, trend information unavailable
-SO_2 emissions embodied in imports	1.66	kg/capita	2018	Achieved, trend information unavailable
-Production-based nitrogen emissions	33.74	kg/capita	2018	Challenges remain, score stagnating or increasing at less than 50% required rate
-Nitrogen emissions embodied in imports	6.96	kg/capita	2018	Achieved, on track or maintaining SDG achievement
-Exports of plastic waste	0.17	kg/capita	2021	Achieved, on track or maintaining SDG achievement
-Non-recycled municipal solid waste	0.99	kg/capita/day	2020	Significant challenges remain, on track or maintaining SDG achievement
SDG 13. Climate action				Major challenges remain, score stagnating or increasing at less than 50% required rate
-CO_2 emissions from fossil fuel combustion and cement production	5.28	tCO_2/capita	2021	Major challenges remain, score decreasing
-CO_2 emissions embodied in imports	0.61	tCO_2/capita	2018	Challenges remain, on track or maintaining SDG achievement
-CO_2 emissions embodied in fossil fuel exports	1.30	kg/capita	2021	Achieved, trend information unavailable
-Carbon pricing Score at EUR60/tCO_2	23.61	%, worst 0-100 best	2018	Major challenges remain, score stagnating or increasing at less than 50% required rate
SDG 14. Life below water				Major challenges remain, score moderately improving, insufficient to attain goal
-Mean area that is protected in marine sites important to biodiversity	3.85	%	2022	Major challenges remain, score stagnating or increasing at less than 50% required rate
-Ocean Health Index: Clean Waters score	70.71	worst 0-100 best	2022	Significant challenges remain, on track or maintaining SDG achievement
-Fish caught from overexploited or collapsed stocks	57.50	% of total catch	2018	Major challenges remain, score stagnating or increasing at less than 50% required rate
-Fish caught by trawling or dredging	18.97	%	2019	Challenges remain, on track or maintaining SDG achievement
-Fish caught that are then discarded	5,38	%	2019	Challenges remain, on track or maintaining SDG achievement
-Marine biodiversity threats embodied in imports	0.01	per million population	2018	Achieved, trend information unavailable
SDG 15. Life on land				Major challenges remain, score stagnating or increasing at less than 50% required rate
-Mean area that is protected in terrestrial sites important to biodiversity	2.33	%	2022	Major challenges remain, score stagnating or increasing at less than 50% required rate
-Mean area that is protected in freshwater sites important to biodiversity	4.17	%	2022	Major challenges remain, score stagnating or increasing at less than 50% required rate
-Red List Index of species survival	0.88	worst 0-1 best	2023	Challenges remain, score stagnating or increasing at less than 50% required rate
-Permanent deforestation	0.01	% of forest area, 3-year average	2021	Achieved, score stagnating or increasing at less than 50% required rate
-Terrestrial and freshwater biodiversity threats embodied in imports	0.68	per million population	2018	Achieved, trend information unavailable
SDG 16. Peace, justice and strong institutions				Major challenges remain, score stagnating or increasing at less than 50% required rate
-Homicides	2.52	per 100000 population	2021	Challenges remain, score moderately improving, insufficient to attain goal

-Unsentenced detainees	15.76	% of prison population	2020	Achieved, score stagnating or increasing at less than 50% required rate
-Birth registrations with civil authority	98.40	% of children under age 5	2018	Achieved, trend information unavailable
-Corruption Perception Index	36.00	worst 0-100 best	2022	Major challenges remain, score decreasing
-Children involved in child labor	3.83	% of population aged 5 to 14	2019	Challenges remain, trend information unavailable
-Exports of major conventional weapons	0.30	TIV consultant million USD per 100000 population	2021	Achieved, trend information unavailable
-Press Freedom Index	33.97	worst 0-100 best	2023	Major challenges remain, score decreasing
-Access to and affordability of justice	0.55	worst 0-1 best	2021	Significant challenges remain, on track or maintaining SDG achievement
-Timeliness of administrative proceedings	0.37	worst 0-1 best	2021	Major challenges remain, score decreasing
-Expropriations are lawful and adequately compensated	0.46	worst 0-1 best	2021	Major challenges remain, score stagnating or increasing at less than 50% required rate
-Persons held in prison	317.63	per 100000 population	2020	Major challenges remain, score decreasing
SDG 17. Partnerships for the goals				Significant challenges remain, score stagnating or increasing at less than 50% required rate
-Government spending on health and education	7.00	% of GDP	2020	Significant challenges remain, score decreasing
-For high income and all OECD DAC countries: International concessional public finance, including official development assistance	Unavailable	% of GNI	Unavailable	Information unavailable, trend information unavailable
-Other countries: Government revenue excluding grants	30.37	% of GDP	2020	Achieved, score stagnating or increasing at less than 50% required rate
-Corporate Tax Haven Score	0.00 (imputed)	best 0-100 worst	2021	Achieved, trend information unavailable
-Financial Secrecy Score	61.13	best 0-100 worst	2022	Major challenges remain, score moderately improving, insufficient to attain goal
-Shifted profits of multinationals	5.73	US$ billion	2019	Achieved, on track or maintaining SDG achievement
-Statistical Performance Index	87.71	worst 0-100 best	2022	Achieved, on track or maintaining SDG achievement
Overall score	70.78/100		Rank	72/166
Spillover score	94.70/100		Spillover rank	75/166

* PPP: Purchasing Power Parity.
** BMI: Body Mass Index. BMI ranges between 18,5 and 24,9 – The level is defined as the 'healthy range'. between 25 and 29.9 – The level is identified as overweight. between 30 and 39.9 – The level is defined as obesity. 40 or over – The level is identified as severe obesity (NHLBI, 2024).
*** PISA is the OECD's Programme for International Student Assessment. PISA measures 15-year-olds' ability to use their reading, mathematics and science knowledge and skills to meet real-life challenges (OECD, 2024).
**** GDP: Gross Domestic Product.
Source: SDR, 2024.

In summary, Türkiye's general situation for SDG indicators is given below. While the success level for the targets is 50%, a limited development of approximately 22-24% and a worsening situation of 25-26% have been determined (Figure 1).

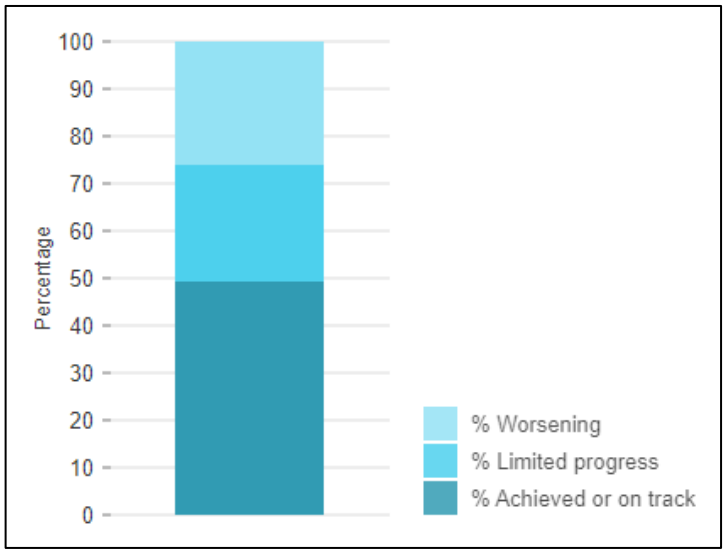

Figure 1. Status of SDG targets for Türkiye (% trend indicators) (SDR, 2024)

In light of the Sustainable Development Goals (SDGs), understanding and addressing the multifaceted relationship between agricultural systems and sustainability indicators is crucial. The interaction between agricultural practices, resource management, and policy frameworks directly influences the progress toward these goals. Therefore, establishing a comprehensive integration strategy for agriculture becomes a key element in ensuring alignment with the overarching sustainability targets. In this context, when the findings of Table 2 are evaluated, it is evident that implementing sustainable agricultural practices is critically important for increasing productivity while protecting the environment and ensuring long-term ecological balance. These practices support the efficient use of existing resources and contribute to the preservation of natural ecosystems for future generations. As noted by FAO (2021), methods such as agroecology and precision farming have proven effective in increasing yields while preserving ecosystems. However, global hunger remains a pressing issue, affecting over 720 million people in 2020, a figure exacerbated by conflicts, climate change, and economic shocks. Agriculture plays a significant role in reducing rural poverty. Akhtar (2022) emphasizes that investments in rural infrastructure, microfinance, and improving farmers' access to markets can drive substantial progress in this area. For instance, India's PM-KISAN program, which provides direct income support to smallholder farmers, has demonstrated notable positive impacts in rural regions. At the same time, agriculture contributes approximately 23% of global greenhouse gas emissions and is both a driver of and vulnerable to climate change (IPCC, 2021). The adoption of climate-smart agriculture (CSA) strategies has proven effective in addressing this dual challenge by promoting both mitigation and adaptation. CSA projects in East Africa, for example, have enhanced resilience by incorporating drought-tolerant crops and improving water management while simultaneously reducing emissions. Furthermore, sustainable food systems are crucial for reducing waste and promoting responsible consumption. The United Nations (2023) has highlighted the necessity of transitioning to circular food systems. In this regard, countries such as Denmark and the Netherlands have achieved remarkable success in reducing food waste through effective policy frameworks and public-private partnerships. These examples demonstrate the transformative potential of agriculture and food systems in advancing sustainable development goals, showcasing their capacity to address critical challenges while contributing to global progress.

4. CONCLUSIONS

In this study, the status of the implementation of SDG indicators in Türkiye is examined and the possible direct or indirect impact and transformations of this situation on agricultural structure and production systems are evaluated. In this context, although it has been determined that many indicators regarding sustainability have been achieved at a significant level, it is observed that there are still significant inadequacies and deficiencies. While significant progress has been made in areas such as poverty reduction, access to clean water, and child nutrition, critical challenges persist in environmental

indicators such as high carbon emissions, biodiversity conservation, and waste management. In this context, adopting effective and integrated strategies is crucial to accelerate the transformation of agricultural production systems and achieve sustainable development goals.

Primarily, Türkiye must strengthen its climate policies and focus on renewable energy projects. Innovative solutions like solar-powered irrigation systems should be widely implemented in the agricultural sector to reduce carbon emissions. Similarly, programs supporting local ecosystems must be developed to conserve biodiversity, and the use of natural fertilizers in agriculture should be encouraged. Expanding smart agricultural practices can enhance agricultural productivity while optimizing the use of natural resources. Financial incentive mechanisms should be established to support small and medium-sized farmers in transitioning to sustainable production techniques. Promoting gender equality and increasing youth employment are also critical for strengthening the agricultural sector. Training and support programs should be organized to ensure greater participation of women in agriculture, and agricultural entrepreneurship projects should be launched to attract young people to the sector. Enhancing data infrastructure and establishing transparent monitoring mechanisms will facilitate more effective tracking of sustainability goals and policy development. Collaborating with international organizations such as FAO and adopting up-to-date, comprehensive data collection methods are essential. Additionally, awareness campaigns should be conducted to promote sustainable consumption habits in society, and policies aimed at preventing waste should be implemented. Finally, Türkiye should foster international collaborations to elevate its agricultural sector to global competitiveness. Increasing international funding and investments for sustainable agricultural projects can accelerate the transformation process in the sector. To enhance agriculture's resilience against global crises, insurance systems should be developed, and research on drought-resistant seed varieties should be prioritized.

Researchers' Contribution Rate Declaration Summary

The authors declare that they have contributed equally to the article.

Conflict of Interest Declaration

The authors declare that there is no conflict of interest between them.

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Evaluation of the Community-based Animal Genetic Improvement Studies: Kilis Goat

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ABSTRACT

This study examines the economic and technical impacts of the genetic improvement studies on Kilis Goat, commenced in Kilis, Türkiye in 2009 within the context of Community-based Animal Genetic Improvement National Scheme. This study also aims to provide a comprehensive overview of Kilis goat farming, and to establish a baseline for future assessments in this breed. The National scheme was first launched in 2006 and has since been extended in five-year intervals. Because genetic improvement studies commenced in 2009 in Kilis Goat, this study focuses only the first six years and considers the firstly included Kilis goat breeders into the scheme, excluding the later inclusions. The complete counts of the scheme-participating farmers (PFs) and randomly selected non-scheme-participating farmers (non-PFs) were the sources of the study data. Kilis goat breeders were interviewed face-to-face during 17 - 22 January 2015, resulting in 59 complete questionnaires (43 participants and 16 non-participant farmers). Descriptive statistics, t-tests, chi-square tests and Mann Whitney U tests were used for two group comparisons as one-way ANOVA with post-hoc LSD test and Krusskal Wallis tests were used for multiple group comparisons in data analysis. The results showed that PFs performed better but this was not enough to produce a significant difference in gross profit per female. The study concluded that own feed production, effective control of goat diseases and parasites and improvement of housing conditions are crucial for successful genetic improvement and overall goat production.

1. INTRODUCTION

Türkiye has a rich biodiversity and farm animal genetic resources accumulated and blended in time by the distinct cultures that prevailed in the past in Anatolia. Dissimilar needs and preferences of livestock breeders in its wide geography also contributed to this rich diversity (TAGEM 2011). So, numerous indigenous small and big ruminant breeds and types are adapted to different ecological conditions in the wide geography of Türkiye. The Kilis goat is just one of these indigenous breeds.

The Kilis goat is a medium-sized, long and strong-bodied domestic goat breed with a well-developed chest and rump. It has a straight back line, a long neck and long pendulous ears. The body is covered with long hair. The colour is usually black, but grey, brown and spotted colours are also seen. Males and females can be horned or hornless (Figure 1). Live weight is 50-60 kg for males and 35-45 kg for females. The lactation period is 210-260 days with a milk yield of 200-300 kg per head. It is a dual-purpose goat breed, but mostly for milk. Its meat is not valuable except for young and newly weaned kids. This goat breed is reared in Kilis, Gaziantep and Hatay provinces. It can walk long distances on rugged terrain and is resistant to diseases, heat and cold weather conditions (TAGEM, 2009; Keskin et al. 2012; ESK, 2024). It is believed that the Kilis goat was formed by the crossbreeding of Damascus and Hair goats in the hands of the public over many years (Keskin and Tüney, 2016).

Fig 1. The Kilis Goat (TAGEM, 2011)

Although Türkiye is rich of indigenous farm animals the yield level of them is not satisfying. Earlier studies conducted in Türkiye before 2000 to increase the meat and milk yield of small ruminants did not yield significant results (Ertuğrul et al. 2010). The most comprehensive studies on this subject began in 2003 with the establishment of sheep and goat breeders' associations and thus the forming of a state support infrastructure for small ruminants. Afterwards, on-site breeding and protection infrastructure was set up with national sheep-goat genetic improvement projects and animal genetic resources protection projects with the cooperation of the General Directorate of Agricultural Research and Policies (TAGEM), Breeders' Associations, Universities and Research Institutes (Cengiz et al, 2015).

Within the framework of the Council of Ministers Decision No. 2005/8503 on Supporting Livestock, in the first 5-year period covering the years 2006-2010, National Small Ruminant Genetic Improvement studies in the Hands of the Public were put into practice in 13 provinces in 12 breeds and types. In the second 5-year period covering the years 2011-2015, these studies continued with one large ruminant and 26 small ruminant breeds and types under the name of "National Animal Genetic Improvement Project in Public Hands" (TAGEM 2012).

Even though aesthetic, sentimental or intangible reasons may sometimes become obvious in traditional small ruminant production systems the main drive of the producers' decision-making is the

maximization of the economic well-being (James 1986). Thus, the main aim of the genetic improvement programs is ultimately to maximize the return on the investment. On the other hand, an important part of an improvement program is the regular analysis of the results obtained (FAO, 2010). These regular analyses should show economic impact at total and unit output, farm and national levels, as well as improvements in all important targeted traits (Philipsson et al. 2011). Herewith, not only corrective measures can be taken to improve the program, but also continued support for the program is ensured by showing the impact of the genetic improvement program.

The present study evaluated the genetic improvement efforts in the hands of the public on the Kilis goat between the years 2009-2014. This study evaluates the first six years of the genetic improvement studies but more importantly addresses major aspects of goat farming and builds a basis for later evaluations. It is expected that the findings will shed light on the decisions about the ongoing and other genetic improvement studies.

2. MATERIAL and METHOD

2.1. Animal Genetic Improvement National Scheme

Community-based genetic improvement programs target low-input systems with farmers working together to improve their genetic resources within a certain geographic area (Mueller et al., 2015).

Launched in 2006 in 13 provinces, the Turkish model of the program initially focused on ten sheep and two goat breeds, including Kilis goat, and has been expanded every five years. In later expansions, the scope of the plan included other indigenous breeds. The current fourth expansion (2021–2025) includes 21 sheep and seven goat genotypes.

Following the three-tier open nucleus breeding model, elite, semi-elite and base flocks were set up for each targeted breed at the beginning of their inclusion in the scheme. In this model, superior animals are promoted from subordinate flocks to superior flocks, and the superior flocks produce males for the one-step subordinate flocks as illustrated in Figure 2.

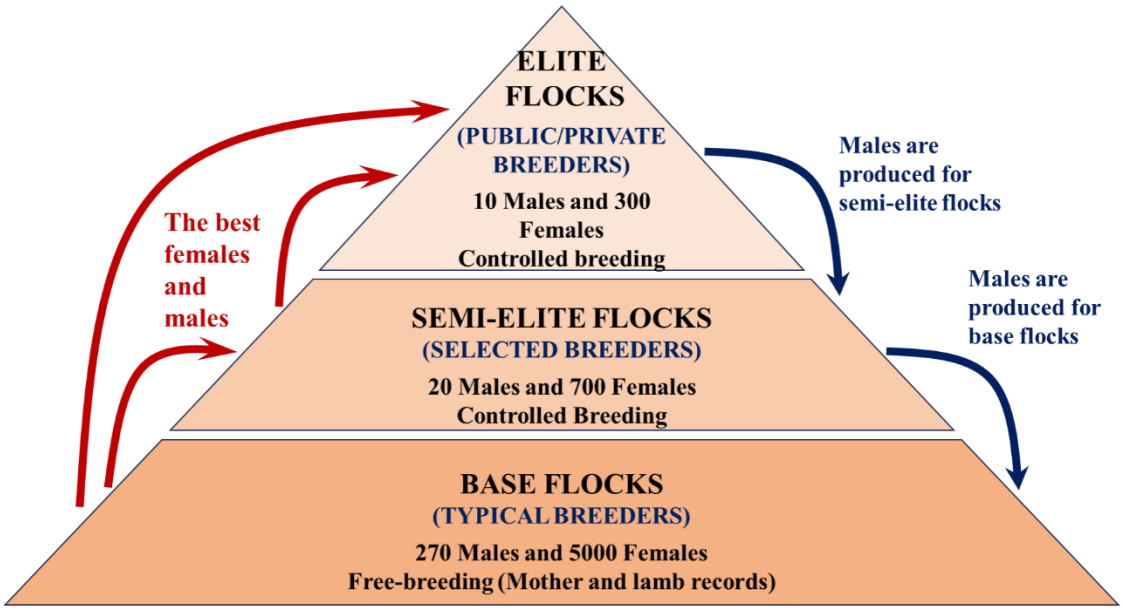

Fig 2. A three-tier open nucleus breeding program employed in the Community-based Animal Breeding National Scheme (adapted from Karaca, 2014)

The scheme is conducted following the Edict on Livestock Implementation Principles and the Instructions for the Community-based Animal Breeding National Scheme Implementation Principles issued by the Ministry of Agriculture. All specified work is conducted according to the work schedule prepared by the project leader of the targeted breed. A project technical staff is employed for each targeted breed to conduct the required field operations and maintain relevant records. Fulfilling their

obligations under the scheme the breeders receive support payments.

2.2. Present Study Material

What needs to be done in evaluating the impact of the genetic improvement project is to be able to reveal whether the result would have been different if the breeding project had not been implemented. It should be expected that the progress achieved through breeding studies, if any, will have a positive contribution to the farm income. So, it was necessary to establish a comparison group to estimates the changes attributable to the scheme (Gertler et al., 2016). For that reason, in this study, breeder farmers included in the genetic improvement scheme (participant farmers, PFs) were compared with their counterparts did not take part but farming with the same breed of animal in the same agroecological environment (non-participant farmers, non-PFs).

The research material consists of data collected through surveys conducted with a) Kilis goat breeders registered to the project since 2009 b) Kilis goat breeders not registered to the project and working in the same agro-ecological environment. The survey study was completed in a period of six days between 17-22 January 2015. In addition, earlier studies on the subject and public and private institution records were used.

2.3. Study Area

The genetic improvement studies on Kilis goats were first started with the breeders in Musabeyli, Polateli and Central districts and their villages of Kilis province in 2009, during the first five-year period (2006-2010) of the national scheme. So, these firstly included Kilis goat breeders were considered, and later inclusions were disregarded in this study aiming to evaluate the genetic improvement efforts in Kilis goat. For that reason, the scope of the study includes the said province, districts and villages.

With an average elevation of 680 m asl, Kilis province has a surface area of 1521 square kilometres and is located between the latitude 36 degrees North and the longitude 32 degrees East in the southwest of the Gaziantep Plateau, which extends between the Euphrates and the Hatay-Maraş trough in the Southeastern Anatolia region, and borders Syria (Figure 3). There are no major altitude differences, and generally, it has the characteristics of a southern slope surrounded by elevations from the northwest, north and northeast (Kilis Valiliği, 2024). Because of its location at the intersection of the Mediterranean climate (tropical) and continental climate, even though it is generally within the Mediterranean climate, Kilis and its locality are under the effect of hot and dry tropical Mediterranean climate in the summer; and the cool and humid air masses specific to the continental climate in the winter.

While the temperature difference between the hottest and coldest month averages is below 20 degrees Celsius on the Mediterranean coast, it is 32,6 degrees Celsius in Kilis, despite not very far from the Mediterranean (approximately 60-80 km as the crow flies) due to the high mountain masses inhibiting effect of the sea. The long-term average (1959- 2023) of annual mean temperature is 17.3 degrees and total precipitation is 499.3 mm (MGM, 2024).

Fig 3. Map of Kilis province and its districts along with the villages where the survey conducted

2.4. Sampling

In this study, breeders and their flocks included in the scheme in the first five-year period (2006-2010) in Kilis goats were considered. Later inclusions were disregarded.

Genetic improvement studies in the public hands are conducted in base, semi-elite and elite flocks. The first two flocks are the breeder flocks as the elite flocks are managed by universities or research institutes.

Since the number of base flock breeders (participant farmers, PFs) was not large, the complete enumeration method was used to collect data (Çiçek and Erkan, 1996). For this purpose, it was planned to conduct surveys with all PFs and with non-PFs roughly equal in number to make comparisons. Face to face interviews resulted in 60 completed questionnaires. Of all 44 were conducted with PFs and only 16 with non-PFs due to the difficulties in finding non-PFs[1]. Yet, a total of 59 questionnaires (43 PFs and 16 non-PFs) were evaluated. The data collected through the questionnaires was entered into the computer according to the previously prepared coding key. Data entries were checked, and incorrect ones were corrected.

2.5. Handling the Data

There are many factors that interact with animal production in extensive production systems and affect success. Therefore, when evaluating a program that aims to improve the entire system, it is necessary to consider these factors together. Some of these factors are related to the farmer (education, age), some are related to the characteristics of the farm (herd size, labour force, type and breed of animals raised, barn size, feed, etc.), and some are related to herd management (feeding, housing, and health). Therefore, PFs and non-PFs were compared in terms of technical and economic success indicators.

2.5.1. Technical Success Indicators

Litter size, kidding rate, infertility rate, abortion rate, kid birth weight, twin or more birth rates, kid mortality rate and milk yield were considered as technical success indicators in the study. It was thought that significant differences between the groups in favour of PFs in terms of these indicators would show the success of the genetic improvement efforts in Kilis goat.

- Litter size was calculated by dividing the number of kids born alive by the number of goats delivered.
- Goat kidding rate was calculated by dividing the number of goats delivered by the number of goats exposed to a male.
- Infertility rate was calculated by dividing the number of empty goats by the number of goats exposed to a male.
- The abortion rate was calculated by dividing the number of goats that aborted divided by the number of goats exposed to a male.
- Twin or multiple birth rate was calculated by dividing the number of twins or multiple births by the number of goats delivered.
- The mortality rate was calculated by dividing the number of kids that died at all ages by the number of kids born alive (Kaymakçı 2016).

In general, breeders do not have the practice of monitoring kid live weights. In PFs' flocks, kid live weights are measured and recorded by project technical staff at birth and certain intervals thereafter. Since kid live weight changes are not monitored in non-PFs' flocks, comparisons between groups could not be possible in terms of postnatal weight gains. However, the existence of some curious non-PFs who recorded kids live weights at birth made it possible to make comparisons between groups in terms of kid birth weight.

2.5.2. Economic Indicators:

In case of desired changes in above-mentioned technical performance indicators within the scope of

[1] Most of the Kilis goat breeders were already included in the national scheme during the second extension period (2011-2015), and those who were not yet included were also aspiring to participate in the scheme.

genetic improvement efforts, an increase in income per female is expected. According to the principles of fully competitive market and production economics, gross production value should at least cover variable costs (Erkuş and Demirci 1996; Drummond and Goodwin 2004). In other words, variable costs are the cost group that plays a role in the production decisions of the producer (here goat farmer). Therefore, gross profit is one of the important criteria that shows the success of the farm and the competitiveness of farm activities. Therefore, gross profit per goat has been considered as the basic economic success in revealing the effect of genetic improvement efforts.

For this purpose, revenue and cost elements were calculated based on the single product budget method, only for the goat farming activity, instead of all products produced in the farms (Aras 1988; Çetin and Tipi 2007). Gross profit per female used in group comparison was calculated by dividing the gross profit calculated per farm by the total number of females at the beginning of the production period.

Gross profit is calculated by subtracting variable costs from gross production value (Erkuş and Demirci 1996; Karagölge 2001). Gross production value is defined as the total value obtained from the main and by-products of the production activity (Karagölge, 2001). It is calculated by adding the productive increases[2] in animal capital to the value obtained by multiplying the amounts of animal products by the prices received by the farmer (Erkuş and Demirci 1996). Variable costs are defined as costs that increase or decrease proportionally depending on the production volume (Erkuş and Demirci 1996). Variable costs are calculated as the total of roughage and concentrate feeds, veterinary, medicine, vaccination, insemination, energy costs, other consumables and shepherd costs (Karagölge, 2001).

In both groups of farms, in addition to Kilis goats, sheep are also raised, albeit in small numbers. Yet, it was not possible to separate goats and sheep in revenue, (e.g. milk and dairy products) and variable cost calculations (e.g. shepherd wages, feed costs, vaccination and medicine-treatment, energy). However, because the number of sheep is generally negligible in respondent breeders whose main activity was Kilis goat, sheep and goat production was evaluated together assuming that sheep activity would not affect the result.

Farm labour was calculated in adult male equivalent (MLE) to eliminate age and gender differences (Erkuş and Demirci 1996). Gross profit was calculated by subtracting variable costs from gross production value (Erkuş and Demirci 1996; Karagölge 2001). Gross production value includes the total value of by-products, and the main product obtained during the production period (Karagölge 2001) and is adjusted with local trade prices and production asset increases (Erkuş and Demirci 1996). Variable costs include roughage, concentrate, veterinary care and medicines, vaccination, energy, consumables, shepherd wages and revolving fund interest (Karagölge 2001).

The revolving fund interest is calculated by applying the real interest rate to half of the variable cost. The real interest rate was calculated as 1.76% for 2014 by considering the producer price index increase (7.9%) and the current interest rate (9.8%; Kıral et al. 1999). As the ability of household members to do farm work varies by age group and gender, the age and gender distribution of households can also vary significantly across farms. So, farm labour was calculated in adult male equivalent to eliminate age and gender differences. In doing this, women aged between 15-64 and men aged 65 and over were converted with a coefficient of 0.75, and children aged between 7-14 and women aged 65 and over were converted with a coefficient of 0.50 (Erkuş and Demirci 1996).

While bought animals were assessed based on their purchase cost, animals raised in the farm were valued based on the local trade prices (Yıldırım and Şahin 2003). The farm-produced manure, straw and grass that was used as input was not valued further considering them as the internal success of the farm (Erkuş 1979).

2.6. Other Notable Subjects:

Common goat diseases, internal and external parasites (GDIEPs) and their effects on technical success indicators (e.g. birth rate, litter size and mortality rate) and the Kilis goat farming challenges were other issues addressed in the study. For this purpose, breeders were asked to evaluate GDIEPs as

[2] It is the income generated by the increase in the value of young animals within a year as a result of age change in farms that raise their breeding material and is calculated by adding the value of the animals sold and slaughtered to the end-of-period flock value and deducting the beginning-of-period flock value and the value of the purchased animals (Kıral et al. (1999).

well as important breeding challenges on a scale of 1-5 (lowest to highest). Unanswered questions were considered as "not affected". To eliminate the noise in the data and to disclose more serious GDIEPs and challenges, scores of 4 and 5 were coded as 1 and the others as 0 and the evaluations were made accordingly.

2.7. Data Analysis:

In statistical analyses, descriptive statistical methods were used to reveal the status of the farms. The gross profit difference between PFs and non-PFs was checked with the Independent Samples t Test; as the comparisons for the differences regarding GDIEPs, GFCs and other categorical variables were made with the chi-square test. When using the independent samples t test, Levene's test (Levene 1960) was employed to check if the groups had equal variances.

In addition, the two-sample Kolmogorov-Smirnov test was used to assess whether PFs and non-PFs were drawn from the same population. Normality assumptions were checked using the Skewness-Kurtosis and Kolmogorov-Smirnov tests. Skewness-Kurtosis values were assumed to indicate the normal distribution of the targeted variable when they lay between 1.5 and +1.5 (Sokal and Rohlf 1994; Tabachnick and Fidell, 2013). Non-parametric Mann-Whitney U test was used when the normal distribution assumption was violated. Data analysis was performed using the IBM SPSS 23.0 software package (IBM Corp. 2015).

3. FINDINGS

3.1. Descriptive Statistics

To present the status of the Kilis goat breeder farmers, demographic characteristics of the farms, farm labour, farmland, flock size, number of female goats and sheep in the flock, animal pens and own produced and purchased feeds were presented with relevant statistical comparisons in Table 1.

Table 1. Descriptive statistics for the study variables

Variable	Non-participant farmers			Participant farmers			t/U*	P
	N	Mean	Sx̄	N	Mean	Sx̄		
Farmer age	16	42.94	3.48	43	48.58	2.07	-1.41	0.164
Farmer experience	***16***	***20.00***	***2.66***	***43***	***28.60***	***1.79***	***-2.56***	***0.013***
Farmer schooling years	16	5.25	0.74	43	4.77	0.30	U	0.475
Male labour	16	2.44	0.30	43	2.99	0.24	U	0.207
Female labour	16	1.61	0.21	43	1.70	0.13	-0.35	0.727
Total labour	16	4.05	0.37	43	4.69	0.30	U	0.249
Own land	16	2.01	0.58	43	2.35	0.50	-0.39	0.701
Rented land	***16***	***0.65***	***0.28***	***43***	***0.30***	***0.17***	***U***	***0.018***
Farmland	16	2.66	0.76	43	2.65	0.50	0.00	0.998
Number of ewes	16	11.88	4.27	43	16.09	3.22	-0.72	0.477
Number of goats	***16***	***99.94***	***9.11***	***43***	***153.42***	***11.63***	***U***	***0.010***
Flock size (number of females)	***16***	***111.81***	***9.70***	***43***	***169.51***	***12.71***	***U***	***0.010***
Pen size	16	148.13	13.64	43	159.86	16.29	U	0.678
Pen size per female	***16***	***1.41***	***0.13***	***43***	***0.99***	***0.08***	***U***	***0.010***
Own-produced feedstuffs (%)	16	5.43	3.31	43	11.36	3.56	U	0.411
Purchased straw (%)	16	14.89	4.17	43	21.93	2.99	U	0.208
Purchased grains (%)	16	38.35	5.02	43	43.39	3.93	-0.71	0.484
Purchased compounds (%)	16	2.13	1.02	43	3.85	1.11	U	0.376
Purchased concentrates (%)	16	79.61	5.77	43	66.64	3.89	1.78	0.080
Purchased cotton seed/pulp (%)								
Percentage of Ewes (%)	16	9.72	3.37	43	9.02	1.83	U	0.993
Gross revenue per female (₺)	16	570.33	58.64	43	560.60	38.64	0.134	0.894
Variable costs per female (₺)	***16***	***214.48***	***32.85***	***43***	***153.78***	***15.55***	***1.876***	***0.066***
Gross profit per female (₺)	16	355.85	48.35	43	406.82	38.60	-0.73	0.469

*U: Mann-Whitney U test

As can be seen from Table 1, only the differences between the groups in terms of farmer experience, number of goats raised, flock size and pen floor area per female were found to be significant ($p<0.05$). The average farmer age was 47.1±1.8, and it was higher in PFs.

In PFs, the farmer experience was also higher, and the average of all breeders was calculated as 26.3±1.6 years. The schooling years, time spent in a formal education institution, was higher in favour of non-PFs, and was calculated as 4.9±0.3 for all breeders.

Since small ruminant farming is a labour-intensive activity, the labour force potential of the goat farmers is important and was calculated to be 2.8±0.2 and 1.7±0.1 in adult male equivalent (AME) for males and females, respectively.

Total labour potential for all breeders was 4.5+-0.2 AME. The average own and rental lands per farm were found to be 0.23±0.04 ha and 0.04±0.01 ha respectively. Kilis goat breeders also raise sheep, albeit in small numbers, and approximately 9% of the females per farm were sheep.

The average number of Kilis goats and sheep were 138.9±9.3 and 14.9±2.6 per farm as the average pen floor area was 156.7±12.4 square meter per farm, and 1.1±0.1 square meter per female. Although the total pen floor area per farm was less in non-PFs, this was reversed for the pen floor area per female. In other words, the pen floor area per female was significantly higher in non-PFs ($p<0.05$).

The shares of home-grown feed, total concentrated feeds and the purchased grain feeds in total diet were calculated to be 10.3±3.3, 70.2±3.3 and 42.0±3.2 per cent, respectively. A significant portion of Kilis goat breeders (66%) also reported that they purchased cottonseed pulp or seed, corresponding to around 25% of the total diet. The feeds and their compositions used by PFs and non-PFs were given in Figure 4.

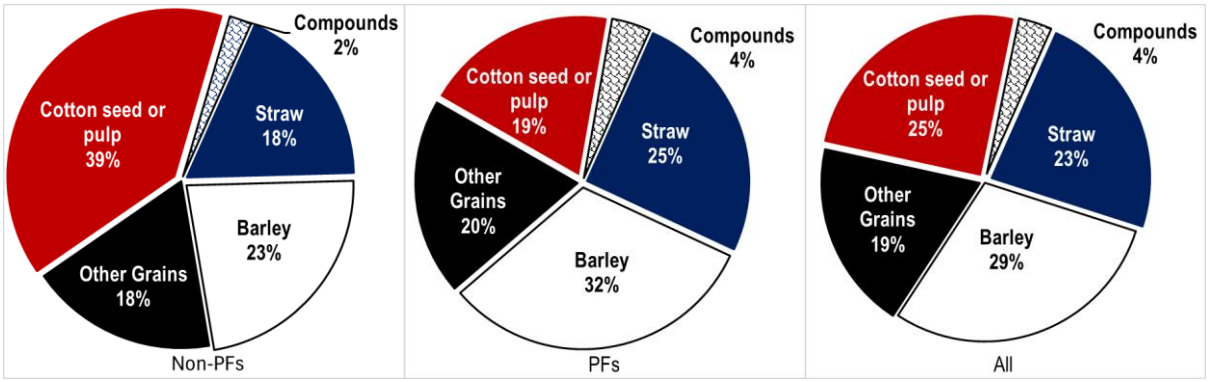

Fig 4. The feeds and their compositions in total diet used by PFs and non-PFs

As seen in Figure 4, PFs used more barley and straw, less other grain feeds and cottonseed or pulp, while non-PFs used more cottonseed or pulp, less barley and other grain feeds and less straw.

On the other hand, approximately 54% of the pens were traditional and the rest were concrete buildings. 12 per cent of the non-PFs and 33% of the PFs had concrete pens. However, the difference between the groups was not significant ($p>0.1$).

3.2. Technical Success Indicators

Although it is generally related to herd management and breeder expertise, it is expected that animal gene improvement efforts will cause increases in live weight, milk yield, fertility rate, and litter size, along with decreases in abortion rate, infertility rate and postnatal lamb mortality rates. The results related to technical success indicators were given in Table 2. There were significant differences between the two breeder groups in favor of PFs on milk yield, twin birth rate, and kid birth weight ($p<0.05$). Although insignificant ($p>0,1$), non-PFs had higher kidding rates, litter size, abortion rate, infertility rates and kid mortality rates. Non-PFs had about two times higher kid mortality rates compared to the PFs but the non-parametric Mann-Whitney U test did not justify the difference between the groups (Table 2).

Table 2. Calculated technical success and flock health indicators for sheep production in both participant (PFs) and non-participant farmers (non-PFs)

Indicators	Non-PFs			PFs			t/U*	P
	N	Mean	Sx̄	N	Mean	Sx̄		
Milk yield (kg/day)	***15***	***1.12***	***0.13***	***38***	***1.54***	***0.11***	***-2.23***	***0.03***
Twin birth rate (%)	***16***	***28.56***	***5.02***	***43***	***40.03***	***2.78***	***-2.09***	***0.041***
Triplet or more birth rate (%)	16	1.80	0.79	43	1.57	0.29	0.34	0.733
Kid live-weight at birth (kg)	***13***	***2.87***	***0.19***	***43***	***3.39***	***0.11***	***U***	***0.020***
Kidding rate (%)	16	85.81	1.86	43	85.21	1.41	U	0.745
Litter size (head)	16	1.40	0.08	43	1.30	0.07	U	0.627
Abortion rate (%)	16	9.13	1.84	43	6.95	0.76	U	0.426
Infertility (%)	16	4.88	1.06	43	4.72	0.80	0.11	0.917
Kid mortality (%)	15	18.47	4.91	43	9.67	1.10	U	0.194

*U: Mann-Whitney U test

Goat diseases and internal-external parasites (GDIEPs)

GDIEPs cause kid and adult deaths, as well as deterioration in the yield and quality of hair and milk and the reproductive performance of the flock. As sheep, goats live in flocks, graze together and share the same pen. This makes easily spread GDIEPs and makes controlling them challenging. Zoonotic animal diseases, on the other hand, can threaten human health, if not controlled. PFs and non-PFs were compared for the most common GDIEPs, and the results are presented in Table 3.

The severity and ranking of the most important GDIEPs were similar in both groups. PFs were better only for foot and mouth disease, intestinal nematodes, enterotoxaemia, liver fluke, pseudotuberculosis and anthrax in respective order of importance. The farmer groups had no significant difference regarding the first three GDIEPs. PFs were significantly reported enterotoxaemia and pseudotuberculosis less than non-PFs did ($p<0.05$). Again, the difference was marginally significant ($p<0.1$) between PFs and non-PFs on behalf of the first group regarding the foot and mouth disease, liver fluke and anthrax reports (Table 3).

Table 3. Distribution of the most reported goat diseases and internal-external parasites (GDIEPs) by participant (PFs) and non-participant farmers (non-PFs)

Declared GDIEPs	Non-PFs (N = 16)		PFs (N = 43)		Total (N = 59)	Chi-square	P
	N	%	N	%			
Tapeworm	11	68.8	27	62.8	38	0.181	0.671
Goat tick	10	62.5	25	58.1	35	0.092	0.762
Mastitis	9	56.3	21	48.8	30	0.256	0.613
Foot and Mouth Disease	***10***	***62.5***	***15***	***34.9***	***25***	***3.642***	***0.056***
Septicaemia	8	50.0	15	34.9	23	1.120	0.290
Brucellosis	7	43.8	13	30.2	20	0.951	0.329
Intestinal nematodes	8	50.0	12	27.9	20	2.540	0.111
Enterotoxaemia	***9***	***56.3***	***10***	***23.3***	***19***	***5.814***	***0.016***
Goat plague	7	43.8	10	23.3	17	2.388	0.122
Goat pox	6	37.5	10	23.3	16	1.197	0.274
Liver fluke	***7***	***43.8***	***9***	***20.9***	***16***	***3.072***	***0.080***
Contagious agalactia	5	31.3	9	20.9	14	0.686	0.407
Pseudotuberculosis	***6***	***37.5***	***5***	***11.6***	***11***	***5.146***	***0.023***
Anthrax	***4***	***25.0***	***3***	***7.0***	***7***	***3.622***	***0.057***

Goat farming challenges (GFCs)

Many researchers focus on farming challenges since they do not allow farmers to run their businesses more efficiently. The importance of these challenges increases especially as the size of the

farm decreases (Collinson, 1985). Since small ruminant farming is generally conducted by small-sized family farms, knowledge of breeder problems will make it easy to take precautions against these problems and at the same time, it will be possible to see whether there is progress in subsequent surveys.

In this study, respondents were asked about the biggest challenges in goat farming. High shepherd wages and shepherd shortages are interrelated challenges and were combined into a single "shepherd challenge" category. Similarly, old and insufficient pens were combined into a "pen challenge." Table 4 presents the distribution of the most often reported GFCs by PFs and non-PFs. The severity and ranking of most GFCs did not differ between the groups. Low product prices and the shepherd challenge ranked first and second for both groups, although the rankings of the latter's components, high shepherd wages and the shepherd shortage differed in groups. Of all declared breeder challenges only the challenges of high input prices and insufficient rangelands significantly impose more seriousness for the non-PFs compared to the PFs ($p<0.05$). The rest followed the same order of importance in both groups (Table 4).

Table 4. Distribution of the most reported goat diseases and internal-external parasites (GDIEPs) by participant (PFs) and non-participant farmers (non-PFs)

Declared challenges	Non-PFs (N = 16)		PFs (N = 43)		Total (N = 59)	Chi-square	P
	N	%	N	%			
Low product prices	16	100.0	38	88.4	54	2.033	0.154
Shepherd Challenge	13	81.3	38	88.4	51	0.505	0.477
Shepherd shortage	11	68.8	33	76.7	44	0.393	0.531
High shepherd wages	12	75.0	31	72.1	43	0.050	0.823
Lack of grazing water	11	68.8	27	62.8	38	0.181	0.671
High input prices	**14**	**87.5**	**22**	**51.2**	**36**	**6.473**	**0.011**
Diseases	10	62.5	22	51.2	32	0.604	0.437
Pen challenge	10	62.5	21	48.8	31	0.873	0.350
Insufficient Pens	8	50.0	17	39.5	25	0.523	0.470
Old Pens	7	43.8	14	32.6	21	0.637	0.425
Rangeland violations	5	31.3	17	39.5	22	0.342	0.559
Lack of dairy houses	8	50.0	13	30.2	21	1.988	0.159
Wild animals	8	50.0	12	27.9	20	2.540	0.111
Insufficient rangelands	**9**	**56.3**	**10**	**23.3**	**19**	**5.814**	**0.016**
Nomad problem	5	31.3	12	27.9	17	0.064	0.804
Insufficient vet. services	4	25.0	11	25.6	15	0.002	0.964
Lack of livestock exchange	2	12.5	8	18.6	10	0.309	0.578

3.3. Economic Success Indicators

As previously mentioned, the gross profit calculated per female was considered as the economic success indicator in Kilis goat breeding.

Gross Production Value

In the farms studied, gross production value (GPV) was calculated as the sum of animal production value and productive value increases and given in Table 5.

Table 5. Gross revenue components for the respondent goat farmers

	Non-PFs			PFs			All Respondent Farmers		
Gross Revenue Components	N	Mean	%	N	Mean	%	N	Mean	%
Productive Value Increases	16	37936.9	59.5	43	58818.4	61.9	59	53219.4	61.4
Milk and products	16	24930.0	39.1	43	34873.0	36.7	59	32157.0	37.1
Other revenues	16	892.6	1.4	43	1330.3	1.4	59	1213.5	1.4
Total Revenue	16	63759.5	100.0	43	95021.7	100.0	59	86676.5	100.0
Number of Females	16	111.8		43	169.5		59	153.9	
Total revenue per female	16	570.3		43	560.6		59	563.2	

In both groups of farms, the largest share of the GPV was the productive value increases. The share of milk and dairy products in the total GPV was found to be slightly higher in non-PFs. The reason for the higher GPV in PFs was most likely due to the larger flock size. However, this difference in terms of GPV per female changed in favour of non-PFs even though not significant (p>0.1).

Variable Costs

Variable cost components incurred in Kilis goat farming were presented in Table 6. The most important variable cost components were feed expenses and shepherd wages in both groups, respectively. Consumable expenses and energy expenses were given under the heading of other expenses. No significant differences were detected between the groups in terms of variable cost components (p>0.1).

Table 6. Variable cost components incurred in Kilis goat farming

	Non-PFs			PFs			All Respondent Farmers		
	N	Mean	%	N	Mean	%	N	Mean	%
Feed costs	16	15635.7	65.2	43	16840.6	64.6	59	16947.4	64.7
Shepherd wages	16	5875.4	24.5	43	6439.1	24.7	59	6469.9	24.7
Vaccination and cure costs	16	1630.7	6.8	43	1798.8	6.9	59	1807.4	6.9
Other costs	16	431.7	1.8	43	521.4	2.0	59	523.9	2.0
Sub-total	16	23549.4	98.2	43	25599.9	98.2	59	25722.3	98.2
Interest	16	431.7	1.8	43	469.2	1.8	59	471.5	1.8
Total variable costs	16	23981.1	100.0	43	26069.1	100.0	59	26193.8	100.0
Number of Females	16	111.8		43	169.5		59	153.9	
Total var. costs per female	16	214.5		43	153.8		59	170.2	

Gross Profit

Gross profit was calculated by deducting the variable costs from the GPV of Kilis goat farming activity (Table 7).

Table 7. Gross profit calculation for Kilis goat breeding activity

	Non-PFs		PFs		All Respondent Farmers	
	N	Mean	N	Mean	N	Mean
A- Total Revenue	16	63759.5	43	95021.7	59	86676.5
B- Total variable costs	16	23981.1	43	26069.1	59	26193.8
C- Gross profit (A-B)	16	39778.4	43	68952.6	59	60482.7
Number of Females	16	111.8	43	169.5	59	153.9
Gross profit per female	16	355.8	43	406.8	59	393.0

As can be seen from Table 7, PFs made 51.0 TRY more gross profit per female than non-PFs. However, this difference was not statistically confirmed (p>0.1).

4. DISCUSSION

Farmer's Age and Education Level: Farmer's age is an important factor in the adoption of innovations. Although it is said that older farmers are more resistant to adopting innovations (Haden and Johnson, 1989), it is also a fact that they have more experience because they started farming at an early age.

On the other hand, the level of education plays a key role in easier understanding and use of technical information, easy access to information and therefore better implementation of farming activities (Rogers, 1983) and positively affects farming success. Planning animal breeding activities, their timely and correct implementation, and intervening and resolving the problems encountered in a

prompt and correct manner are essential for successful breeding. This is possible with sufficient and correct knowledge of animal farming.

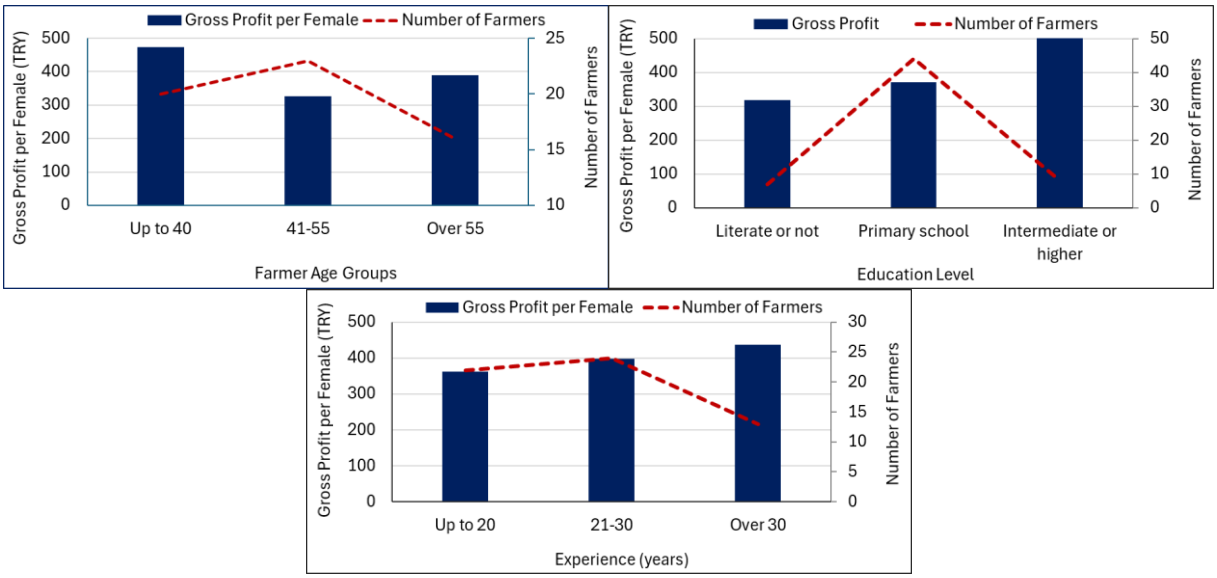

Fig 5. The effect of age, education and experience of the farmer on gross profit per female

Polat (2021) reported that average age of the small ruminant farmers in Kilis province was around 49 years with an average farming experience of 32 years. For the education level of the Kilis goat farmers, Polat (2021) also reported that around 72% had primary school and 13% secondary and high school as 15% had no formal education degree. Of all present study respondents, about 12% had no formal education as around 75% had primary education and 14% graduated from higher level institutions, corresponding to an average of 4,9±0,3 years of formal education. Present study findings regarding age and education level of farmers were more or less in harmony with the Polat (2021). Similarly, PFs and non- PFs did not differ significantly in age and education. However, both groups of farmers significantly differed regarding experience possible due to that more experienced breeders were selected to participate into the scheme.

As earlier stated, age and education positively affect farm success and that it is possible to see the effect of age and education level on gross profit per female, taken as an indicator of economic success in the study, in Figure 5. The difference between farmer age groups 1 and 2 is significant ($p<0.05$). Again, the difference between education level groups 1 and 3 and 2 and 3 is significant ($p<0.05$). In other words, it is seen that breeders aged 40 and younger and breeders with secondary school education and above earn more gross profit. Although experience increases at older ages, education level decreases. It is evaluated that breeders in the middle age group (41-55) generally have primary school-level education and less experience.

Labour: Small ruminant farming is a labour-intensive activity. Milking, grazing, pen cleaning and animal care require significant labour. The source of labour in farms is the family labour force. The need for labour in farms increases with farm size. Therefore, the labour potential of the farmer family is important in meeting labour needs and reducing labour costs.

In Kilis goat farming, although the contribution of men is greater (60%), daily care work is carried out jointly by both sexes. However, shearing is generally conducted by men and milking by women, and a significant portion of the labour required for milk processing (80%) is provided by women.

Kaygısız et al. (2024) reported that about 12% of goat farms in Mersin province hired shepherds as the rest met their needs from farm labour. In similar studies conducted with goat farms in Uşak, Manisa, İzmir and Isparta provinces, it was reported that 90% and more of the goat breeders met shepherd needs with family labour (Demirhan and Erdem 2019; Taşkın et al. 2010a; Acar and Ayhan 2012).

In Kilis goat farming 36% of the goat farms meet their shepherd needs from family labour, while others hire shepherds. It has been determined that goat farms with a majority male workforce tend not to hire shepherds, they tend to meet their needs from their household workforce while the farms with a majority female workforce tend to hire shepherds. It was determined that 75% of the labour required for Kilis goat breeding was provided by men and 25% by women. Figure 6 shows the gross profit distributions per female of the Kilis goat breeders across various labor force and flock size groups.

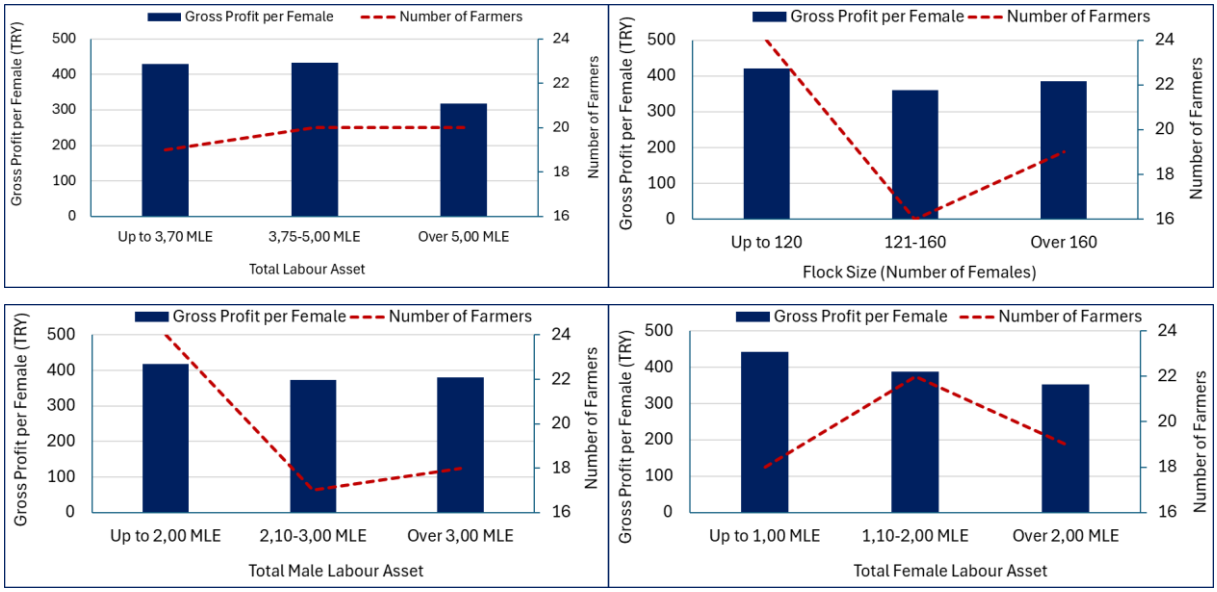

Fig 6. Gross profit per female across labour asset and flock size groups

Although not statistically significant, as the labor capacity of the goat farms increases in favor of female labor, economic success decreases (Figure 6). This may be related to the increasing flock size and the tendency of farms with a majority female workforce to hire shepherds since gross profit per female decreases as the herd size increases. Thus, an inversely proportional relationship existed between the labor potential of farms and the gross profit per female. In other words, farms with more labor force made lower gross profit per female, suggesting that labor, especially female labor, is not used efficiently in goat farms.

Construction type of pens: Small ruminant pens are generally inadequate in design, construction materials and size. Furthermore, ambient cleanliness is often not controlled adequately in pens. The most reliable animal welfare indicators recommended for animal pens are the level of lighting and the floor area per female (Sevi et al. 1999). In the evaluation of animal pens, light intensity and floor area per animal, volume and ventilation rates are key indicators (Caroprese et al. 2009).

In the present study, only the pen floor area per female and the type of pen construction were considered with the expectation that pen construction type might provide an idea about the design and ambient cleanliness, although not very definite. According to the results, more than half of the pens in both groups of farms were built in the traditional style, and there was no statistically significant difference between the groups in this respect ($p>0.1$).

As can be seen from Figure 7, the farms with concrete pens had more gross profit per female than those with traditional animal folds, most probably due to their higher animal welfare standards.

Pen Floor Area per Female: The stocking density (animal/area) is a significant factor affecting animal welfare and so performance. Although the space requirements of animals of various ages such as kids, yearlings, and adults vary, an average of 1.5 square meters of pen floor area per female is recommended (Cooper, 2022; El Sabry and Almasri 2023).

Wang et al. (2022) studied three stocking densities (low: 0.67 goat, medium: 1 goat and high: 2 goats per square meter) and reported that stocking density affected the rumen environment and high

stocking density (2 goats per square meter, i.e. 0.5 square meter per head) resulted in a decrease in growth, the digestive and immune function of Matou goats.

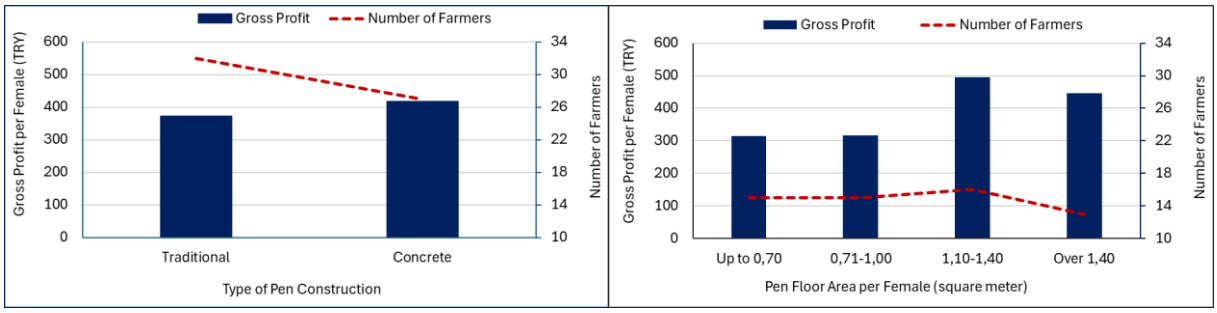

Fig 7. Gross profit per female across construction types of animal pens and pen floor area groups

It is considered that pen floor area requirement may be slightly less than 1.5 square meter per female for Turkish goats due to their small-framed bodies although Taşkın et al. (2010b) recommended 1.8-2.0 square meter indoor floor area per adult goat. Accordingly, in Figure 7, the highest gross profit per female was calculated for goat farms providing 1.1-1.4 square meter floor area per female, and according to the post-hoc LSD test, the differences between Groups 1 and 3, and groups 2 and 3 were significant ($p<0.05$).

Composition of the Supplementary Feed Diet: Goats make the best use of roughage among farm animals, and the basic rule in goat breeding is to benefit from rangelands as much as possible. It is reported that goats do not need to be fed additionally except for lactation and fattening, but in rainy periods when animals cannot graze and so are kept inside, approximately 60-70% of dry matter needs can be met from roughage and 30-40% from concentrates or grains (Taşkın et al. 2010b).

Kilis goats are generally grazed throughout the year, but supplementary feeding is also done in the last stages of pregnancy, in lactation to meet the increased nutrient needs of lactating animals, or in the winter because pasture grass cannot meet the animal needs. The number of breeders using supplement feed is at its highest level in the four-month period between December and March, and begins to decrease by the end of March, and is at its lowest level in June, July and August, and begins to increase again in September (Figure 8).

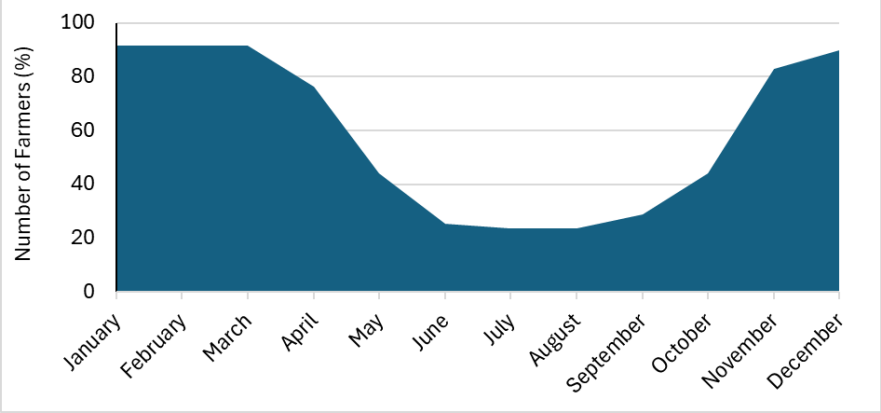

Fig 8. Distribution of the percentage of farmers using supplementary feeding by month (%)

The average amount of feed used per year per female for all farms was calculated about 163 kg. On average, 32%, 34% and again 34% of these farms use 78 kg, 131 kg and 275 kg feed per female, respectively. Approximately one third of Kilis goat farmers produced at least some of the feed they need

themselves (32%). The share of home-grown feed in the total feed used was calculated to be 11.4% by PFs and 5.4% by non-PFs on average. However, the groups did not differ significantly (p>0.1; Table 1). Gross profit per females across the proportions of various feed components in the diet were given in Figure 9.

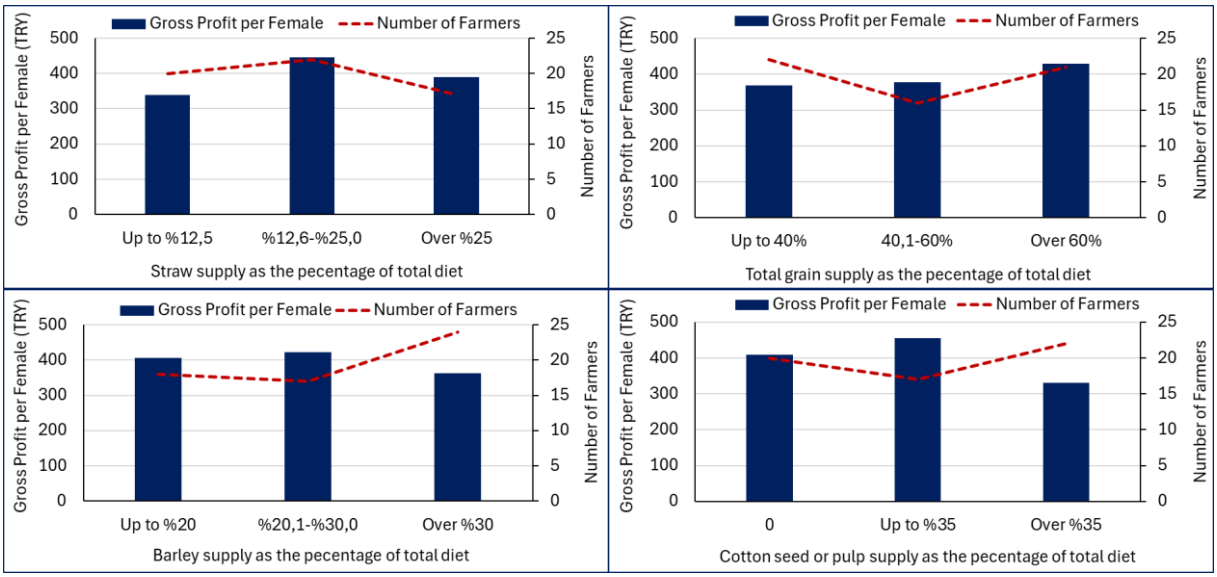

Fig 9. The effect of frequent feed supplies on gross profit per female

Although groups did not differ significantly, Figure 9 suggests that gross profit per female decreases when the percentages exceed 25% for straw, 30% for barley and 35% for cotton seed in the total diet. On the other hand, according to Figure 10, the highest gross profit per female was achieved with the diet composition of straw, grains, cotton seed/pulp and compounds with percentages of 26, 52, 20 and 2 per cent respectively.

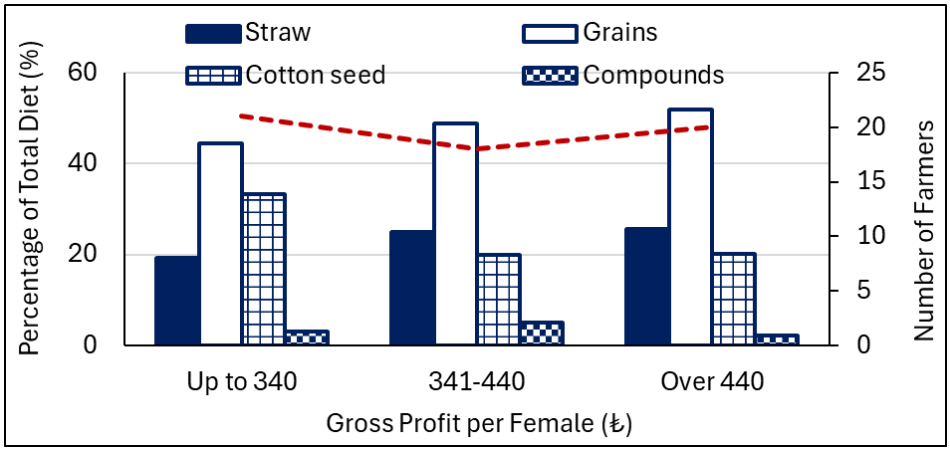

Fig 10. The variation of the gross profit per female by the composition of the total diet

Technical Success Indicators: Although it is generally related to herd management and breeder expertise, it is expected that animal gene improvement efforts and ensuring animal welfare will ultimately cause increases in birth weight, milk yield, kidding rate, and litter size, along with decreases in abortion rate, infertility rate and postnatal lamb mortality rates. The results related to technical success indicators are given in Table 2.

Kilis goats are distinguished with their high milk yield among the native goat breeds in Türkiye. So, the primary aim of community-based Kilis goat breeding studies is to increase milk yield. (Keskin et al. 2022).

Lactation milk yield can vary year to year due to unfavourable conditions in some years by limiting grazing and making use of grasslands. Limited and inadequate grazing together with insufficient supplement feeding, which is quite likely in extensive farming conditions, can cause fluctuation in milk yield (Gül et al. 2024). Thus, different researchers reported different milk yield figures for Kilis goats. Keskin (2000) reported the lactation milk yield and lactation period in Kilis goats raised in Hatay as 348-395 kg and 247.8 days, respectively. Behrem and Keskin (2013) reported the lactation milk yield as 390.6 ± 27.12 kg. In another study, milk yield for Kilis goat x hair goat crosses was reported as 298.6 ± 17.10 litres (Keskin et al. 2016). Daşkıran et al. (2022) gave the lactation period and milk yield under breeder conditions as 225.22 ± 7.75 days and 201.05 ± 6.75 kg, respectively. Keskin et al. (2022) reported that lactation milk yield increased from approximately 175 kg to 346 kg according to the results of a five-year study in Kilis goat breeding herds in Kilis province. Gül et al. (2024) reported the lactation milk yield as approximately 368 kg according to five-year study records in Kilis goat breeding herds in Gaziantep.

On the other hand, the sustainability and profitability of animal production depend on fertility (Keskin and Tüney 2016), the birth rate (kidding rate), the number of offspring obtained per birth (litter size) and the survival rate of the offspring obtained are important parameters in this regard.

Tatar et al. (2019) calculated the birth rate as 99.30%, the single birth rate as 53.35%, the twin birth rate as 41.73%, the triplet birth rate as 4.08%, and the fertility rate as 150.70% (corresponding 1,5 offsprings per birth, i.e. litter size) in Kilis goats. Keskin et al. (2022) reported that the fertility in Kilis goats ranged between 114,9 and 126,7%. (i.e. 1,15-1,27 offspring per birth).

Another technical success indicator and important developmental trait is birth weight. Although it varies according to gender and birth type, Gül et al. (2024) reported the average kid's birth weight as 3.56±0.01. Keskin and Tüney (2016) reported the birth weight as 3.9±0.08; Keskin et al. (2016) reported it as 3.5 ± 0.65 kg for Kilis goat x hair goat crosses. Keskin et al. (2022) reported the birth weight for Kilis goat breeding herds as 3.1±0.01. The same researchers reported that the calving rate for the years 2016-2020 varied between 62.4% - 92.1%; and the kid yield per goat that gave birth varied between 114.9% - 126.7%.

On the other hand, the survival rate is also an important parameter, and many relevant studies reported weaning survival rates. Keskin et al. (2022) reported survival rates ranging from 77.6% to 100%. In the present study, the mortality rate was taken as the negative proxy of survival rate and a 12% kid mortality rate was calculated for all farms, corresponding to around an 88% survival rate. In the present study, on the other hand, the lactation period, daily milk yield, twinning rate, litter size and kid birth weight were calculated as 230.6±4.9 days, 1.42±0.09, 36.2%, 1,33±0,05 heads per birth. and 3.27±0.10 kg respectively on average for all respondents.

Considering the above-given evaluations, it can be accepted that the present study findings fall within the ranges of the results reported by previous studies.

Infertility (not being pregnant), abortion or miscarriage (termination of pregnancy) and kid mortality are the causes of economic losses in a flock. Approximately 5-8% of infertility, around 3-5% of miscarriage and a maximum of 10% of offspring mortality rates can be accepted normal (Atasoy, 2016; Rişvanlı et al. 2016).

The infertility, abortion and kid mortality rates were calculated as 4.76±0.65%, 7.54±0.75% and 11.98±1.58% on average for all farms, respectively. According to these results, it can be said that there was no problem in terms of infertility. However, high abortion rates above upper limits imposed a problem for both breeder groups. Similarly, while kid mortality rates pushed the upper limit for PFs, the situation was quite not encouraging for non-PFs (Table 2).

Effect of GDIEPs on several technical indicators: Many studies conducted worldwide have shown that diseases and internal-external parasites of animals cause significant economic losses due to production decrements and high treatment costs, i.e. decreases in milk production and carcass weights, weak offspring, stillbirth and abortions, growth retardation, adult and offspring deaths, skin and leather damage, low feed conversion efficiency, increased labour needs, etc., (Hale and Coffey 2011; Kumar et

al. 2013; Roeber et al. 2013; Koyuncu et al. 2019; Lokamar et al. 2020; Al Moheer et al. 2022; Challaton et al. 2023).

Study findings also revealed similar results for GDIEPs such as scabies, sheep tick and brucellosis, necrotic hepatitis, and anthrax (Table 8).

The effect of septicaemia disease on the kidding rate was found to be significant ($p<0.01$). The differences between the birth weights of kids born in breeders' flocks reporting and not reporting Brucella and pica were significant. But surprisingly kid birth weights were in favour of breeders reporting Brucella ($p<0.05$) but against those not reporting pica ($p<0.01$).

Higher birthweights associated with brucella seem to contradict the current knowledge and to be surprising. However, this may be explained by the selection effect of brucellosis when remembering that singletons have high birthweight compared to twins and triplets (Keskin et al. 2022). That is, weak offsprings may have died at the earlier stages of pregnancy due to brucellosis and the remaining healthy single offspring may have reached a higher live weight. Anyway, 1.4-fold and significantly higher twin birth rates calculated for the farms not reporting brucella might evidence and justify this argument.

Table 8. The effect of some goat diseases and internal-external parasites (GDIEPs) on kidding rate, kid live weight at birth, and kid mortality

GDIEPs	Farmers declaring no problems			Farmers declaring problems			t	P
	N	Mean	Sx̄	N	Mean	Sx̄		
Kidding rate								
Septicaemia	***36***	***87.13***	***1.39***	***21***	***82.28***	***2.02***	***U***	***0.009***
Kid birthweight								
Brucella	***38***	***3.14***	***0.09***	***18***	***3.54***	***0.21***	***-2.05***	***0.046***
Allotriophagia	***51***	***3.35***	***0.10***	***5***	***2.45***	***0.25***	***2.83***	***0.007***
Kid mortality								
Allotriophagia	51	10.98	1.35	5	22.40	11.31	U	0.196
Twin birth rate								
Brucella	***39***	***40.52***	***3.19***	***20***	***29.90***	***3.62***	***2.06***	***0.044***
Tapeworm	***21***	***45.64***	***4.80***	***38***	***32.10***	***2.58***	***2.72***	***0.009***
Goat tick	***24***	***46.58***	***3.99***	***35***	***30.29***	***2.75***	***3.48***	***0.001***
Pseudotuberculosis	***48***	***39.00***	***2.80***	***11***	***27.85***	***5.04***	***1.76***	***0.083***
Liver fluke	***43***	***40.14***	***3.02***	***16***	***28.27***	***3.75***	***2.17***	***0.034***

Allotriophagia or pica refers to abnormal appetite for materials other than normal feed in the forms of licking or eating soil, stone, pieces of broken earthenware pottery, hair, plaster and chalk etc. The reasons may vary from the low serum iron levels to various nematodes (Sharma et al. 2000) and it may also be associated with mismanagement practices that cause stress (Caroprese et al.2009). However, the significant low birthweight offsprings of the respondents reporting pica is most likely related to low serum iron levels since low birthweight is reported as one of the adverse pregnancy outcomes associated with iron deficiency (Georgieff 2020).

Moreover, it was found that tapeworm and goat tick had very significant ($p<0.01$), brucellosis and liver fluke had significant ($p<0.05$) and pseudo-tuberculosis had marginally significant ($p<0.1$) negative effects on twin birth rates.

Effect of GDIEPs on gross profit per female: Farmers were asked about twenty GDIEPs to give marks from 1 to 5 according to their seriousness. As explained earlier, the scores of 4 and 5 were coded as 1 and the rest was 0 to eliminate noise in the data. Again, the respondent farmers were categorized according to their number of complaints about GDIEPs. They varied from zero to 15 complaints out of 20 GDIEPs. Figure 11 represents the relationship between the number of complaints and the achieved gross profit per female.

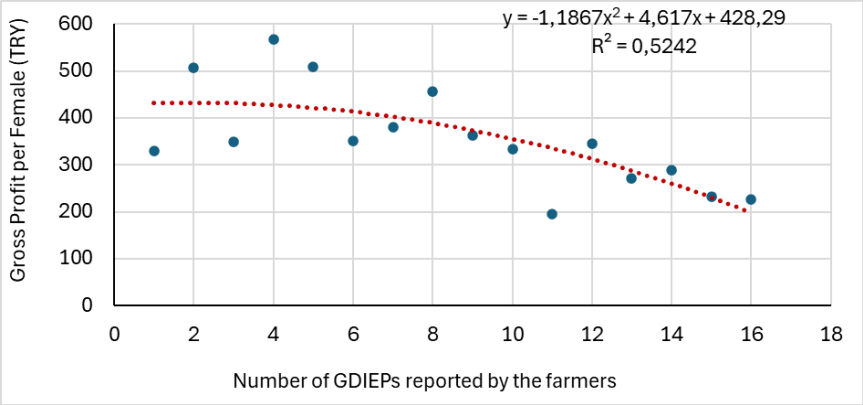

Fig 11. The effect of GDIEPs on gross profit per female

It is clearly seen from the Figure that the farmers with a greater number of complaints about the GDIEPs achieved less gross profit per female. Again, significant differences in gross profit per female were detected between the declaring and not declaring breeder groups for some certain GDIEPs.

Respondents reported goat plague and scabies in their flocks achieved significantly less gross profit per female. Again, marginally significant less gross profit per female was calculated for those reported anthrax, liver fluke and intestinal nematodes (Table 9).

Table 9. The effect of some goat diseases and internal-external parasites (GDIEPs) on gross profit per female

	Farmers declaring no problems			Farmers declaring problems				
GDIEPs	**N**	**Mean**	**Sx̄**	**N**	**Mean**	**Sx̄**	**t**	**P**
Anthrax	*52*	*412.89*	*33.34*	*7*	*245.23*	*61.85*	*1.78*	*0.080*
Goat plague	***42***	***440.14***	***34.39***	***17***	***276.52***	***58.22***	***2.50***	***0.015***
Intestinal nematodes	*39*	*432.18*	*38.96*	*20*	*316.58*	*47.47*	*1.80*	*0.077*
Liver fluke	*43*	*425.82*	*37.05*	*16*	*304.80*	*51.35*	*1.77*	*0.082*
Scabies	***51***	***420.89***	***32.33***	***8***	***215.15***	***76.04***	***2.36***	***0.022***

5. CONCLUSIONS

Genetic improvement studies aim to increase farm animal productivity per head to achieve sustainable food production. In Türkiye, farm animal genetic improvement studies started in 2006 in nine sheep and two goat breeds continue with five-year extensions. One of the two goat breeds included in the breeding program in 2006 was the Kilis goat, and studies were started in 2009 with a three-year delay.

One of the objectives of the study was to reveal the economic and technical impacts of the genetic improvement studies conducted on Kilis goats at the farm level. However, considering that genetic improvement studies are a long-term process, and the short span of the coverage only between 2009-2014 years of the scheme, this study is of greater importance in terms of revealing the status of Kilis goat breeding and obtaining basic data for future evaluations.

The difficulty in ensuring homogeneity in PFs and non-PFs groups that were compared was the limitation of this study. In order to reveal whether the two groups differ in terms of a trait or practice examined, randomness in forming the groups is thought to provide the homogeneity of the groups which is important to make sure whether the observed changes on the dependent variable (technical and economic indicators in the present study) are really due to the treatment effect (here, genetic improvement studies). Otherwise, the reliability of the estimates will be questionable. In such studies, the propensity score matching technique is used to obtain homogeneous groups and avoid this problem. However, in the present study, this technique could not be used due to the difficulties in finding non-PFs in adequate numbers.

On the other hand, in the present study comparing PFs and non-PFs, it was inevitable that there would

be differences between the two groups regarding either the breeders or their flocks due to the criteria taken into consideration in the selection of breeders and animal material to be included in the scheme, e.g. selecting more experienced breeders and selecting the animals that phenotypically have the breed characteristics (TAGEM 2012). Moreover, since working with the minimum number of breeders possible to provide a total of 5700 female and 300 male animal materials (Figure 2) in each breed will facilitate the studies of the scheme, it should be expected that the flock size of the PFs will be larger than the non-PFs, due to the selection of the breeders with relatively larger flock sizes.

In the comparison of two groups of breeders, litter size, kidding rate, infertility rate, abortion rate, live weight of kids at birth, twin or multiple birth rate and kid mortality rate were considered as technical success criteria, while gross profit per female (GPpF) was used as financial success indicator.

Although the homogeneity of the goat breeder groups is questionable, among the socioeconomic variables that reveal the status of the farms, only the differences in terms of farmer experience, flock size and pen floor area per female were found to be significant ($p<0.05$). The differences between the groups in terms of farmer age, education level, male and female labour force and total labour force, farmland, pen floor area, the rate of feed provided by the farm and the rate of purchased straw, grain feed and concentrated feed in total feed are insignificant.

The reason for the less pen floor area per female in PFs was their larger flock size but the difference regarding pen floor area was insignificant ($p<0.1$).

According to the results, PFs significantly differed from non-PFs in terms of milk yield, twinning rate, live weight of kids at birth ($p<0.05$). Again, although not significant, non-PFs had higher kidding rate, more litter size, higher abortion, infertility and kid mortality rates. As a result, PFs obtained higher gross profit per female but the difference between the two groups was not significant.

The better financial performance of the PFs might be due to their more experience (Figure 5). On the other hand, larger sized flocks' ownership can be said to have a negative rather than positive effect on PFs' gross profit achievement, due to the inverse relationship between the gross profit per female and the flock size (Figure 6). In addition, non-PFs were statistically better off in terms of pen floor area per female, which had a positive effect on gross profit up to a certain extent. Therefore, since some indicators were in favour of PFs as some others were in favour of non-PFs, heterogeneity of the groups can be considered balanced regarding their achieved financial success.

However, better performance of the PFs in terms of technical indicators did not suffice to yield significant financial performance possibly for their less pen floor area per female and the similarity in severity and ranking of the most important GDIEPs and the GFCs in both groups.

There was no significant difference between the two groups of farmers in terms of diseases and internal-external parasites, and the farmer challenges. The most often mentioned diseases and parasites by both breeder groups were ticks, tapeworms and mastitis. Similarly, the importance and order of most challenges were found around the same for both groups. Low product prices and the shepherd challenge ranked first and second for both groups. Of all declared breeder challenges only the challenges of high input prices and insufficient rangelands significantly imposed more seriousness for the non-PFs compared to the PFs ($p<0.05$).

Polat (2021) mentioned similar small ruminant diseases and parasites and breeder challenges in her study conducted in 2017 with farmers who were members of the Sheep-Goat Breeders Association in Kilis province. It is most likely that these diseases and parasites and the breeder challenges presented in Tables 3 and 4 still prevail today.

Feed expenditure and shepherds' wages were the most significant cost components in goat farming, accounting for approximately 65% and 25% of the variable costs, respectively. High feed expenditures hinder profitability, even though small ruminants generally have lower nutritional requirements. Shepherd wages were high due to a shortage of shepherds, a problem rooted in social issues such as a lack of social security and low societal status.

Based on the study results, the following suggestions can be made for the success of genetic improvement studies and Kilis goat farming:

(1) Feedstuff production: Farmers should be encouraged and supported to produce their own feedstuff to minimize feed costs and perform profitable goat farming.

(2) Address shepherding problems: Shepherding is one of the most important challenges in livestock farming. As a solution:
- Shepherding should be made more appealing through employing certified shepherd system with attractive social security benefits.
- As an interim solution, breeders' unions can recruit shepherds, who have flock management and rangeland management certificates, through service procurement from commercial companies.
- In the long term, associate degree shepherding programs should be offered by universities and only the graduates of these programmes should be accepted into the profession to ensure effective animal grazing and sustainable rangeland use.

(3) Improving housing conditions: Farmers should be encouraged and supported to renovate animal pens to ensure adequate floor area and volume per female, ventilation, aeration, lightning and ambient cleaning.

(4) Regular assessments: At least every ten years assessments should be repeated to monitor progress and take measures.

Ethics Approval

With the decree dated 01.10.2014 and numbered 1550, the Committee on Scientific Research and Publishing Ethics at Dicle University confirmed that the present study conforms to the generally accepted scientific and ethical principles.

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Researchers' Contribution Rate Declaration Summary

AK performed all the work related to the design of the study, collection and analysis of the data, interpretation of the results, and drafting and substantive revision of the manuscript.

Conflict of Interest Declaration

The author reports that there are no competing interests to declare.

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A Comparative Study Of The Reality Of Breeding Bees In Iraq And Syria From The Point Of View Of Beekeepers

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ABSTRACT

Aim of this research is comparing state of bee breeding in Iraq and Syria, know state of bee breeder's through every research item, and find correlation between dependent and independent variables of research. Study sample included all bee breeders in Mosul - Iraq and from rural Damascus - Syria. A simple random sample was (120 (bee breeder, was taken (60) breeder from Iraq and (60) breeder from Syria. Results showed that bee breeders follow scientific methods in tending bees, researchers have required knowledge to run bee hive operations and that the following independent variables (academic achievement, purpose of bee breeding, training courses) play important role in applying bee breeders the correct guidance recommendations to enhance knowledge of bee breeders regarding bee breeding.

1. INTRODUCTION

Bee breeding and producing honey is an important ancient agricultural activity. Old Greeks and Romans considered honey divinish gift and food of gods, ancient man drew bees on walls, containers, plates and coins, considered it a sacred insect, engraved on coffins and tombs of prestigeous people and on walls of pyramids in ancient Egypt. Honeybee symbolizes honesty, loyalty, bravery and defying death (Krokafeer, 2009), (Al-Ghamedi, 2017). Bee breeding acquired great importance in agricultural sector not only localy but also globally. This importance came from bees' final product (i.e.honey) rich in nutritions, role to increase agricultural production up to 30%. This indicates the importance of bees in increasing food production, preserving wild species through mixed pollination of flowers. Bees don't only pollinate economical crops but also pollinate wild plants used by humans industrially and medically as well as part of balanced ecological system (Tareq, 2015), (Al-Saegh, 2015).

Breeding bees is a successful project and one of productive branches of the agricultural sector especially locally, given final product of bees of natural honey that is important in nutrition and health. For long times, breeding bees paid back positively on both man and environment. Bees are the most dedicated animals. Bees and other pollinating animals helps to increase grains, nuts, fruits as well as big variety, better quality and productivity, which in turn will provide food security (FAO, 2020), (Al-Saegh, 2018).

Managing and breeding honeybees, increase its kinds is an important agricultural production branch, a capital –free agricultural occupation (Al-Khafaje and Al-Badri, 2016). Bees productivity in Arab homeland, all together is no more than (2000 t/y) of honey, except for 6 countries (Algeria-Morocco-Tunisia-Egypt-Yemen-Syria). Iraq is least state in producing honey (Abe Al- Fotoh, 2015). Iraq's production of honeybees for 2018 was (1000t/y) which doesn't meet even half of local consumption that reached (2480 t). In Iraq, honeybee is considered one of economical insects, an important food source for many people. Breeding honeybee is a subsidiary job for an extra income (Mahana and Homam 2016). Breeding bees contribute in local agricultural production via natural honey, as well as (natural wax, royal feed, bee parcels, bee poison, pollination). This shows that breeding bees contributed in (53 billion iraqi dinars) in local gross production for 2007 mainly in three main products (natural honey, wax, and bees parcels) (Abe Al- Fotoh, 2015) (Nonita, 2015). Bee breeding is practiced by wide sector of farmers in Iraqi governorates. Despite these big numbers of bee breeders, there is lack of expertise is found among some bee breeders, lack of appropriate circumstances to breed bees, low production levels, not to forget to mention problems faced by bees like pests that decreased number of cells as well as breeders (Majde and Abdul Emam, 2016). This decrease affected production and productivity Breeding bees require expertise, knowledge of all apiary processes, certain roles that must be mastered, a knowledge of bee itself and its behaviours through seasons. Recently, Syria also suffered sharp fall in number of bee cells (about 19.5%) for many reasons decrease in number of cells which is globally known as loss and decline of bees colonies (Al-Hasnawe, 2012).

Here comes the role of agricultural guidance as linking tool between researchers specialized in breeding bees and beekeepers. Agricultural guides seek to know problems faced by beekeepers, increase their knowledge about raising bees, what they need from authorities to implement and solve (Soleman, 2018) (Al-Zaedi and Ashwaaq, 2016). Summary, bee breeding is considered an important aspect that must be focused on in programs of agricultural guidance. Because Nineveh governorate in Iraq Damascus in Syria are known for big number of bees as well as breeders, the researchers decided to make this research to know reality of breeding bees in both above mentioned governorates and know all the stages.

Aims of research:

1- Know the reality of bee breeding in Iraq and Syria in general.

2- known reality of breeding bees in each field of research.

3- Arrange research aspects according to respondent’s responses.

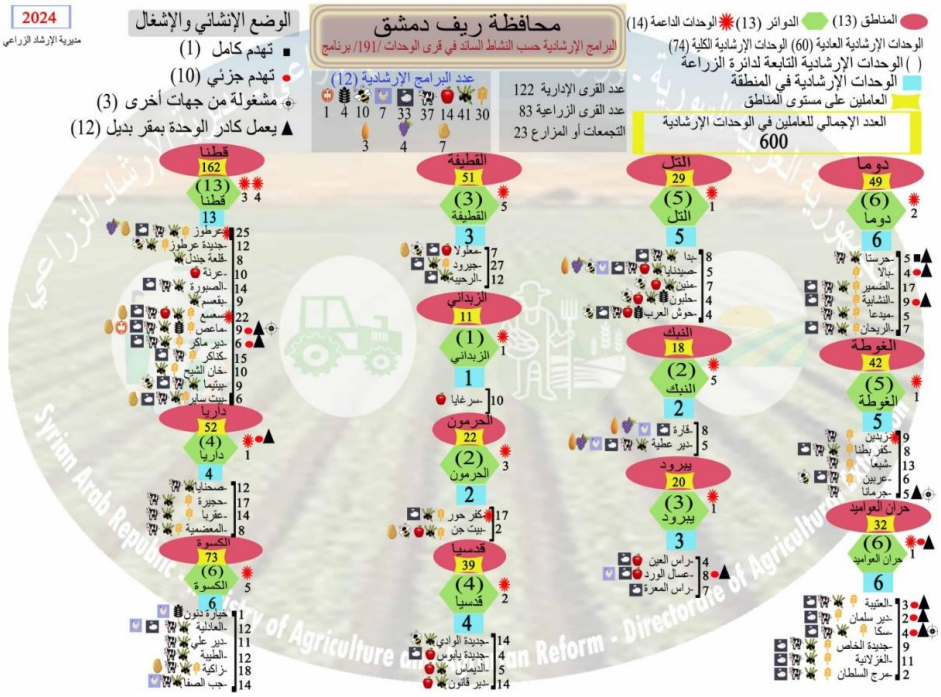
4- know the correlation between reality of breeding bees and independent variables of research (academic achievement, years spent in breeding bees, purpose of breeding bees, courses in breeding bees, and sources of information about breeding bees).

2. MATERIAL and METHOD

2.1. Society and Sample of Research

Research took place in Iraq and Syria due to large numbers of bee breeders, society included all bee breeders in (rural Damascus – Syria) and (Mosul-Iraq). A simple random sample (120) was chosen to be (60) in both cities.

This figure explain the bee breeders in rural Damascus – Syria (Jbawi, 2024).



2.2. Design of Research Tool

A two-part survey was used to collect data from breeders of Iraq and Syria:

First part: Several independent variables related to bee breeders: (academic achievement, years spent as a bee breeder, purpose of bee breeding, training courses of breeding bees, sources of information about bee breeding).

Second part: included five aspects related to breeding bees, with (45 items), items were formed respectively: field of building apiary (14 items), running apiary processes (8 items), feeding bees (7 items), and bees' diseases (10 items) and marketing honey (9 items) as shown in table (1):

Table 1. Field and item of research

	Items	Always	Sometimes	Seldom	Never
	1st aspect: building apiary				
1	Follow exact time to begin apiary				
2	Keep prescribed distance between apiary and food source				
3	Build apiary near clean water source.				
4	Build a room at apiary.				
5	Put cells under decidous trees when building apiary.				
6	Make sure that apiary floor is grass free.				
7	Keep apiary cells in row within the prescribed distance.				
8	Build apiary in a place far from orchards and zoos.				
9	Prefer to keep prescribed distance between every apiary.				

10	Choose an environment with flowers and nectars to build apary
14	Depend on magazines to record bees' species.
	2nd: running apiary processes.
1	Check cell on spring and summer from time to time.
2	Follow scientific steps when doing checks after protecting myself well.
3	Know where to stand when doing checks.
4	Know best place to check tires
5	Make sure to smoke cell while checking.
6	Buy bees' species on desired time (February, March).
7	Follow guidance recommendations when checking bees' species
8	Follow orders when preparing apiary floor
	3rd aspect: feeding bees
1	Know importance of every food for bees.
2	Depend on most important material to feed bees.
3	Concentration of sweet serum must be within correct limits.
4	Must know level of concentration of sweet serum all year long.
5	Make sure to provide sweet serum in different ways.
6	Make sure to provide all species at one time.
7	Want to know symptoms of lack of nutrition in cell.
	4th aspect: diseases of bees
1	I know symptoms of parallel of bees.
2	I know symptoms of diareah
3	Know symptoms of cyst of overians.
4	Know symptoms of American rotten overians
5	Know times of Euroean rotten overian
6	Know symptoms of parallel of bees
7	Know symptoms of diareah
8	Know enemies of bees
9	Know where enemies of bees are
10	Cooperate with other bee keeprs to fight pesticites
	5th aspect: marketing honey
1	Follow main dates during harvest
2	Know tools used to purify honey
3	Know best jars to save honey
4	Keep honey jars always well locked
5	Make sure that temperature in rooms saving honey is not high
6	Avoid saving honey in refridgerators
7	Put labels of information on honey jars
8	I can tell real from fake honey
9	Make sure that transporting cars are equipped with safety gears

2.3. Design of Research Tool

A- Measuring dependent variables:

- Academic achievement: measured through the following levels: reads and writes, primary graduate, middle school, secondary, institution, BSc. Agriculture, postgraduate, graded (1, 2, 3, 4, 5) respectively.

- Years of experience as a bee breeder: measured by numbers of years spent in bee breeding,

- Purpose of breeding bee: a-as a hobby, b-to meet my family needs of honey, c-improve family income, d-as an occupation. Each alternative got one degree.

- Training courses in breeding bees: measured by number of courses the breeder took during data collection.

- Sources of information about breeding bees: measured through a group of references each alternative got a degree.

B- Measuring dependent variable (reality of breeding bees):

Measured through 4alternative scale (always, sometimes, seldom, never) and graded (1, 2, 3, 4) respectively. By collecting data of bee breeders on every item we will have final degree.

- Collecting data:

After completing research tool (i.e.questionaire), process of collecting data from bee breeders in Nineveh-Iraq and Damascus – Syria began from 1/4/2024 until 1/2/2024

- Statistical means:

The following means were used to analyze data

1- Percentage

2- Repitions

3- Pearson conjunction factor

4- Spearman brown equation

3. RESULTS and DISCUSSIONS

1- Know the reality of bee breeding in Iraq and Syria in general:

Results showed that the highest number bee breeders (respondents) got was (192) (theoretical perspective) and the least was (48) with an average of (140) bee breeders were categorized according to real state of bee breeding as shown in table (2). Table (2) shows that the category of highest rate of bee breeders was medium (96-142) reaching 70.83% and the least was in low (48-95) reaching 12.50%. Meaning that reality of bee breeding is medium tends to high. The reason may be that bee breeders follow correct recommendations and information in breeding bees, their state of breeding bees is positive.

Table 2. Categorized of respondents according to their to real state of bee breeding

Categories	Number	%
Low (48-95)	15	12.50
Medium (96-143)	85	70.83
High (144-192)	20	16.67
Total	120	100.00

2- Know state of bee breeding in each field of research:

First field: Building Apiary:

Results show that highest score of researchers was (56) and the least (14) with an average of (40). Respondents were categorized according to their building of an apiary as shown in table (3):

Table (3) shows that category with highest score was moderate (28-41) reaching 58.32% and the lowest was (14-27) got 16.67%, meaning that reality of breeding bees is moderate tends to be high, meaning that bee breeders follow correct procedures and recommendations of how to build an apiary and the conditions needed.

Table 3. Categorized of respondents according to field of building Apiary

Categories	Number	%
Low (14-27)	20	16.67
Moderate (28-41)	70	58.23

High (42-57)	30	25.00
Total	120	100.00

Second Field: Running apiary

Results showed that highest score of researchers was (32) and the least was (15) with an average of (21). Respondents were categorized according to processes of running an apiary as shown in table (4).

Table (4) shows that the category that scored high was moderate (16-23) scoring 54.17% and the least was low one (8-15) scoring 20.83% meaning that bee breeders regarding running apiary is moderate tends to rise. Reason is that bee breeders adopt correct recommendations and information's in running an apiary.

Table 4. Categorized of respondents according to field the running apiary

Categories	Number	%
Low (8-15)	25	20.83
Medium (16-23)	65	54.17
High (24-32)	30	25.00
Total	120	100.00

Third Field: Feeding bees

In this aspect, results showed that highest value was (28) and the least (7) with an average of (19). Respondents were categorized according to feeding bees into the following divisions shown in table (5).

Table (5) shows that category with highest number was moderate (14-20) with a rate of 75% and the least was in low category (7-13) scoring 8.33% meaning that reality of breeding bees is moderate tends to high. This may be because bee breeders follow all that is correct and scientific regarding breeding bees.

Table 5. Categorized of respondents according to field the running apiary

Categories	Number	%
Low (7-13)	10	8.33
Medium (14-20)	90	75.00
High (21-28)	20	16.67
Total	120	100.00

Four Field: Bees' diseases:

Results showed that highest score was (40) and the least was (10) with an average of (25). Bee's breeders were categorized according to their reaction to bee's diseases as shown in table (6).

Table (6) shows that category of highest percent was moderate (20-29) with a rate of 54.17% and the least was low (10-19) with a ratio of 22.50% meaning that researchers regarding reality of breeding bees is moderate tends to high. The reason may be that bee breeders follow correct recommendations when it comes to diseases of bees. State of breeding bees is acceptable.

Table 6. Distribution of respondents according to field of bees' diseases

Categories	Number	%
Low (10-19)	27	22.50
Medium (20-29)	65	54.17
High (30-40)	28	23.33
Total	120	100.00

Fifth Field: Marketing honey:

Results showed that highest score in this field was (36) and the least was (9) with an average of (140). Researchers were categorized as shown in table (7).

Table (7) shows that moderate category (18-26) got highest score 41.67% and low category (9-17) got the lowest score 25% meaning that bee breeders level is moderate tends to high due to their information about bee breeding.

Table 7. Distribution of respondents according to field of marketing honey

Categories	Number	%
Low (9-17)	30	25.00
Medium (18-26)	50	41.67
High (27-36)	40	33.33
Total	120	100.00

3- Arrange research fields according to answers of respondents:

Four aspects of research were arranged according to answers given by bee breeders as shown in table (8).

Table (8) shows that running an apiary came first according to respondents answers meaning that bee breeders have enough information and skills of breeding bees.

Table 8. Arrange the research items according to the answer of respondents

Categories	Mean	Sequence
Running apiary	3.70	1
Bees' diseases	3.20	2
Building apiary	3.10	3
marketing	2.90	4

4- Know the correlation between the reality of bee breeding and independent variables:

1- Academic achievement:

Respondents were categorized according to academic achievement as shown in table (9):

Table (9) shows that highest number was BSc. Agriculture with (20.83%), reads and write (8.33%) the lowest. Results also showed there is correlation between reality of bee breeding and variable of academic achievement. Spearman rank conjunction factor value was (*0.014) it is significant at (0.05), thus rejecting null hypothesis stating that no correlation significant between state of bee breeding and academic achievement variable. Meaning that academic achievement of bee breeder plays a great role in correct and scientific application in bee breeding due to academic information's respondents got and being open to private sources of bee breeding.

Table 9. Distribution of respondents according to their breeding of bee and it is relationship with their academic achievement

Categories	Number	%	Spearman rank conjunction factor rs
Reads and writes	10	8.33	
Primary school	15	12.50	
Middle school	20	16.67	
Secondary school	15	12.50	
institute	20	16.67	*0.014
Bsc. agriculture	25	20.83	
postgraduates	15	12.50	
total	120	100	

2- Years of experience as a bee breeder:

Results showed that highest number of years spent was (30), the least (10) with an average of (20) years. Bee breeders were categorized according to their years of experience as a bee breeder as shown in table (10).

Table (10) shows that highest number was moderate sector (17-23) reaching (58.33%) while lowest was in high sector (24-30) scoring (16.67%). Results showed that there is no correlation between reality of bee breeding and years of experience as a bee breeder. Simple Pearson conjunction value (0.0094) it is not significant. Thus accept null hypothesis that there is no correlation significant between reality of bee breeding and years of experience as a bee breeder. Meaning that years spent as a bee breeder don't affect following correct scientific recommendations while other factors may affect following correct recommendations in bee breeding.

Table 10. Distribution of respondents according to their bee breeding and it is relationship with number years of experience as a bee breeder

Categories	Number	%	Simple Pearson conjunction value
Low (10-16)	30	25.00	
Medium (17-23)	70	58.33	
High (24-30)	20	16.67	0.0094
total	120	100.00	

3- Purpose of bee breeding:

Bee breeders were categorized according to purpose of bee breeding as shown in table (11).

Table (11) shows that highest number of researchers was in (as a job) scoring (45.83%) while (Do it as a hobby) with percent (8.34%). Results showed there is correlation between breeding bees and variable of purpose of breeding bees. Spearman rank conjunction value was (*0.024) it is significant at (0.01) level. Thus reject null hypothesis that there is correlation between state of breeding bees and purpose of having bees. Meaning that working as a bee breeder as a job and meet family needs of honey force bee breeder to follow correct instructions and recommendations to gain honey.

Table 11. Distribution of respondents according to their reality of breeding of bee breeding and it is relationship with purpose of bee breeding

Categories	Number	%	Spearman rank conjunction value
Do it as a hobby	10	8.34	
To meet my family needs of honey	15	12.50	
Improve family income	40	33.33	
As a job	55	45.83	*0.024
total	120	100.00	

4- Training courses:

Bee breeders were categorized into these three divisions shown in table (12).

Table (12). Shows that highest number was in trained constituting (70.83%) while untrained was lowest (29.17%). Results showed there is correlation between reality of bee breeding and between state of bee breeding and variable of training courses, the Spearman rank conjunction value was (*0.0171) it is significant at (0.05) level, thus reject null hypothesis stating that there is no morally significant relation between bee breeding and training variable, meaning that training courses that bee breeders take contribute in increasing their knowledge and information, help them to follow related instructions of breeding bees correctly.

Table 12. Distribution of respondents according to their reality of bee breeding and it is relationship with training courses

Categories	Number	%	Spearman rank conjunction value
Practiced	85	70.83	
Untrained	35	29.17	*0.0171
Total	120	100.00	

5- Sources of information:

Sample was categorized into the following divisions as shown in table (13).

Table (13) shows that reference that got highest number was (bee breeders association) (22.50%) while the lowest was (agricultural magazines) (1.67%). Analysis results showed there is no correlation between reality of bee breeding and sources of information about bee breeding. The Spearman rank conjunction value was (0.145), it is not significant. Thus accept null hypothesis stating that no morally significant relation is found between the state of bee breeding and sources of information, meaning that sources of information not play any role in increasing the knowledge of local bee breeders and help them to realize them on field.

Table 13. Distribution of respondents according to the reality of bee breeding and it is relationship with sources of information

Categories	Number	%	Spearman rank conjunction value
Brochures, leaflets and scientific references	5	4.17	
Internet	15	12.50	
Agricultural appliances suppliers	15	12.50	0.145
Guidance symposiums and agricultural training courses	10	8.33	
Agricultural institutes and colleges	10	8.33	
Agricultural tv and radio programs	3	2.50	
`bee breeders association	27	22.50	
Agricultural division or unit	10	8.33	
Agricultural magazines	2	1.67	
Agricultural guide and administrate of preserving plants	8	6.67	
Field explanations about bee breeding	3	2.50	
Other bee breeders	12	10.00	
Total	120	100.00	

4. CONCLUSIONS AND RECOMMENDATIONS

Results showed that bee breeders apply correct scientific recommendations of bee breeding, state of their bee breeding is acceptable. Researchers have efficient knowledge of running an apiary. The following independent variables (academic achievement, purpose of bee breeding, training courses) play a great role in application of respondents for correct Extension instructions. Authors recommend to work and enhance the information and knowledge of bee breeders in order to developing their knowledge in the in the breeding of bee in the research regions.

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Researchers' Contribution Rate Declaration Summary

The authors declare that they have contributed equally to the article.

Conflict of Interest Declaration

The authors declare that there is no conflict of interest between them.

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Ö Z E T

Yabancı işçilerin hukuki statüleri devamlı tartışma konusu olmakla birlikte genellikle sanayi sektöründe ve mevsimlik tarım işlerinde yabancı işçi talep düzeyi yüksek olmaktadır. Mevsimlik tarım işçilerine yönelik hukuki düzenlemeler ülkelerin sosyal, ekonomik, demografik ve coğrafi özelliklerine bağlı olarak farklılık göstermektedir. Türkiye de önemli düzeyde yabancı işçi barındıran bir ülke konumundadır. Bu çalışmanın amacı, Türkiye'de mevsimlik yabancı tarım işçileri ile ilgili uygulamaların hukuki yönünün dünyadaki örneklerle karşılaştırmalı olarak değerlendirilmesidir. Çalışmanın ana materyalini ikincil veriler oluşturmaktadır. Bu kapsamda, dünyada ve Türkiye'de yabancı mevsimlik tarım işçisi konusundaki hukuki metinler ve istatistiki veriler tematik doküman analizi yöntemi kullanılarak değerlendirilmiştir. Tarımda mevsimlik yabancı işçi göçü alan ülkeler genellikle tarım sektöründe gelişmiş ülkelerdir ve bazı dönemlerde ek işgücüne ihtiyaç duymaktadırlar. Amerika Birleşik Devletleri, Kanada, Avustralya ve Birleşik Krallık gibi ülkeler, yabancı mevsimlik tarım işçiler konusunda öne çıkmaktadır. Bu ülkelerde, mevsimlik yabancı tarım işçilerinin yasal olarak ülkeye girişini kolaylaştıracak yapılandırılmış programlar bulunmaktadır. Göç veren ülkeler tarımsal mevsimlik işçi göçü konusunda genellikle hukuki düzenleme yapmamaktadırlar. Fakat Meksika hükümeti, göç eden işçilerin haklarını korumak için hem iç yasal düzenlemeler hem de uluslararası anlaşmalar ile vatandaşlarının (özellikle ABD ve Kanada'da çalışanlar) güvenliğini ve refahını sağlamaya yönelik çalışmalar yapmaktadır. Türkiye'de ise yabancı mevsimlik tarım işçileri özelinde hukuki bir düzenleme bulunmamaktadır. Mevsimlik yabancı tarım işçilerinin hukuki durumunun iyileştirilmesi için uluslararası iş birliği ve ulusal düzeyde daha kapsamlı düzenlemelerin hayata geçirilmesi gerekmektedir. İşçilerin haklarının korunması, çalışma ve yaşam koşullarının iyileştirilmesi ve özellikle sosyal entegrasyonun sağlanarak göç eden işçilerin sağlık taramasından geçirilmesi bu süreçte öncelikli olarak ele alınması gereken konulardır.

A B S T R A C T

The legal status of foreign workers is a constant subject of debate; however, there is generally a high demand for foreign labor in the industrial sector and seasonal agricultural work. Legal regulations concerning seasonal agricultural workers vary depending on the social, economic, demographic, and geographical characteristics of each country. Turkey is in a position of hosting a significant number of foreign workers. The aim of this study is to evaluate the legal aspects of practices related to seasonal foreign agricultural workers in Turkey, in çomarsan with examples from around the world.

The main material of the study consists of secondary data. In this context, legal texts and statistical data regarding seasonal foreign agricultural workers in both Turkey and the world have been evaluated using the thematic document analysis method. Countries that accept seasonal foreign labor migration in agriculture are typically those with a well-developed agricultural sector and periodically require additional labor. Countries such as the United States, Canada, Australia, and European nations like the United Kingdom stand out in terms of foreign seasonal agricultural workers. In these countries, there are structured programs in place to facilitate the legal entry of seasonal foreign agricultural workers. Countries that are sources of migrant labor generally do not implement legal regulations regarding the migration of seasonal agricultural workers. However, the Mexican government takes measures to ensure the safety and well-being of its citizens (particularly those working in the United States and Canada) through both domestic legal regulations and international agreements aimed at protecting the rights of migrant workers. In Turkey, there is no specific legal regulation regarding foreign seasonal agricultural workers. To improve the legal status of seasonal foreign agricultural workers, international cooperation and the implementation of more comprehensive regulations at the national level are necessary. Improving the legal status of seasonal foreign agricultural workers requires international cooperation and the implementation of more comprehensive regulations at the national level. The protection of workers' rights, the improvement of working and living conditions, and particularly the provision of social integration, including health screenings for migrant workers, are priority issues that need to be addressed in this process.

1. GİRİŞ

Mevsimlik tarım işçisi; başka bir tarım işletmesinde ekim, yetiştirme, ilaçlama, hasat gibi tarımsal üretimin herhangi bir aşamasında ücretli olarak sürekli ya da gezici olarak mevsimlik çalışan kişidir (Sarper, 2009; Yılmaz vd., 2021). Mevsimlik yabancı tarım işçisi ise mesleki hareketlilik ya da gelir elde etmek amacıyla yapılan mekân değişiklikleri kapsamında kendi ülkesi dışında başka bir ülkeye belirli bir süre dahilinde çalışmak için gelen kişi olarak tanımlanmaktadır (Zaim, 1974; AB, 2014; Yılmaz, 2017). Bu işçiler genellikle daha yüksek işsizlik oranlarına veya düşük ücretlere sahip ülkelerden gelmekte ve mevsimlik tarım işçiliğine talep olan ülkelerde istihdam fırsatları aramaktadırlar. Bu bağlamda işgücü göçünü etkileyen temel faktörler; iş bulmak, daha iyi çalışma şartlarına sahip olmak, hayat standartlarını yükseltmek olarak sıralanmaktadır (Tüzünkan, 2013; IOM, 2019). Dünyada işçilerin çalışmak üzere göç etmesi 1600'lü yıllara dayanmaktadır (Fereli vd., 2016). Günümüzde de ekonominin globalleşmesi ve mobilitenin artması sebebiyle işgücü göçü hareketi artış göstermektedir. Göç alan ve göç veren ülkeler ise yıllara göre değişim göstermektedir. İşgücü piyasalarında yabancı veya göçmen işçi talebi ve bunların çalıştırılma durumları, tüm dünyada önemi giderek artan bir konu haline gelmektedir. Genel olarak göç ve özelde işgücü göçü çok çeşitli nedenlere dayanmaktadır. Bunların başında, ülkelerdeki siyasal ve ekonomik dalgalanmalar gelmektedir. Son yıllarda da tüm dünyada göç düzeyi artan bir seyir izlemektedir. Dolayısıyla göç alan pek çok ülkede, diğer alanlarda olduğu gibi tarım sektöründe de yabancı işgücü talebi ve çalıştırma konusu ön plana çıkmaktadır. Yabancı tarım işçileri, gıda arzının sürekliliği açısında küresel düzeyde önemli bir role sahip bulunmaktadır.

İşgücü göçü alan ülkelerde, işletmeler yerel işçilerden işgücü talebini karşılayamadığı durumlarda yabancı işçi istihdam etmektedirler. Uluslararası Çalışma Örgütü'nün (ILO) Göçmen İşçiler Küresel Tahmini Raporu'na göre dünya genelinde 169 milyon göçmen işçi bulunmaktadır. Göçmen işçilerin sektörlere göre dağılımına bakıldığında %66,2'sinin hizmet sektöründe, %26,7'sinin sanayide, %7,1'inin de tarımda istihdam edildiği görülmektedir (ILO, 2021a). Tarımda kayıt dışı çalışmanın yaygınlığı göz önünde bulundurulduğunda bu oranın çok daha fazla olduğu öngörülmektedir. Çünkü işgücü göçü yasal yollarla olabildiği gibi yasadışı yollarla da gerçekleşebilmektedir. Bu durum yasal olduğunda işgücü o yerin kalıcı unsuru haline gelirken, yasadışı olduğunda kayıt dışı işgücü özelliğini taşımaktadır (Şimşek, 2000).

Mevsimlik tarım işçilerinin gerek iş yaşamını ve gerekse sosyal sigorta durumlarını doğrudan ve dolaylı olarak konu edinen çok farklı yasal düzenlemeler bulunmaktadır (Sayın, 2023). Bu düzenlemeler, ülkelere göre değişmektedir. Bu durum; ülkelerin coğrafi konumları, ekonomik koşulları, göç güzergahları ve işgücü yapısı ile ilgili kendi iç hukuku farklılıklarından kaynaklanmaktadır. Örneğin; Kanada, Amerika, Avustralya gibi yüksek gelirli ülkelerde işletmeler, tarımda ağır işlerde çalışmaya karşı isteksizlik nedeniyle tarım sektöründe yabancı işgücü talep etmektedir (Martin, 2016).

Mevsimlik yabancı tarım işçilerini en çok istihdam eden ülkelerde genellikle tarım önemli bir sektör olup bu ülkelerde tarımsal üretimin belirli dönemlerinde yoğun bir şekilde ek işgücüne ihtiyaç duyulmaktadır. Tarım sektöründe işgücü göçü konusunda çeşitli çalışmalar bulunmakla birlikte mevsimlik yabancı tarım işçilerle ilgili hukuki düzenlemeler bağlamında karşılaştırmalı bir değerlendirmeye rastlanılmamıştır. Nitekim bu çalışmanın amacı, mevsimlik yabancı işçi çalıştırmada öne çıkan ülkelerin ele alınarak ilgili düzenlemelerin Türkiye ile karşılaştırmalı olarak değerlendirilmesidir. Çalışma kapsamında 2 temel araştırma sorusuna cevap aranmaktadır.

Araştırma sorusu-1: Mevsimlik yabancı tarım işçiler özelinde yapılan hukuki düzenlemeleri ile öne çıkan ülkelerdeki işgücü modelleri hangi unsurları içermektedir?

Araştırma sorusu-2: Türkiye'de mevsimlik yabancı tarım işçiler kapsamında yapılan düzenlemeler, diğer ülkelerdeki uygulamalarla karşılaştırıldığında ne gibi farklılıklar ve benzerlikler göstermektedir?

Araştırmanın kapsamı; ILO ve Avrupa Birliği'nin (AB) uluslararası işgücü düzenlemeleri ile Amerika Birleşik Devletleri (ABD), Kanada, Avustralya, Birleşik Krallık gibi mevsimlik yabancı tarım işçileri için yüksek talep gören ülkelerin uygulamalarını ve bu uygulamaların Türkiye ile karşılaştırmasını içermektedir. Sonuç olarak bu çalışma, mevsimlik yabancı tarım işçiliğine ilişkin literatürdeki eksikliği gidermeyi hedeflemekte ve yasal düzenlemeler arasındaki farklılıkları anlamaya katkı sağlamaktadır. Böylelikle tarım sektöründe çalışmak üzere göç eden yabancı işçilerin ekonomik ve sosyal koşullarının iyileştirilmesine yönelik politika önerilerinde bulunulması hedeflenmektedir.

2. MATERYAL ve YÖNTEM

Çalışmanın ana materyalini, dünyadaki seçilmiş ülkelerin yabancı tarım işçisi odaklı hukuki düzenlemelerini kapsayan yayınlanmış mevcut ikincil veriler oluşturmaktadır. Veriler "tematik doküman analizi" yöntemi ile analiz edilmiştir.

Tematik doküman analizi; yazılı materyaller, hukuki belgeler ve görüşme dokümanları gibi metinsel verilerin analizinde sıklıkla kullanılan bir nitel araştırma yöntemidir. Metinlerde yer alan temaları sistematik bir şekilde belirlemek ve yorumlamak amacıyla kullanılmaktadır (Nowell vd., 2017). Bu araştırma kapsamında yer alan yasal düzenlemelerde "mevsimlik yabancı tarım işçisi" anahtar kelimesi kullanılarak çalışma izni, çalışma koşulları gibi önemli konulara ilişkin veri madenciliği yapmak için "tematik doküman analizi" metodu uygulanmıştır.

3. BULGULAR

Mevsimlik yabancı tarım işçileri konusundaki uluslararası düzenlemeler ve ulusal düzeyde "mevsimlik yabancı tarım işçileri" özelinde programlar hazırlayan ülkeler kapsamda verilmiştir. Temelde bu programlar çiftçilerin, mevsimlik işler için yasal olarak yabancı işçileri istihdam etmesine olanak tanıyarak tarım sektöründeki işgücü açığını gidermeye yönelik tasarlanmıştır.

3.1. Mevsimlik Yabancı Tarım İşçileri ile İlgili ILO Düzenlemeleri

ILO mevsimlik yabancı işçilerin çalışma koşullarını belirlemek amacıyla birçok sözleşme ve tavsiye kararı yayınlamıştır. Bu yasal düzenlemelerin bazıları doğrudan mevsimlik yabancı tarım işçileri ile ilgiliyken bir kısmı da dolaylı olarak bu grup işçileri kapsamaktadır. İlgili kararlar Çizelge 1'de yer almaktadır.

Çizelge 1. Yabancı mevsimlik tarım işçileri ile ilgili ILO düzenlemeleri

Tarih	Yasal düzenleme adı	Kapsam
1949	İstihdam Amaçlı Göç Sözleşmesi	Sözleşme, vatandaş olmayan tüm göçmen işçilerin sosyal güvenlik açısından muamele eşitliğini zorunlu kılmaktadır. Yabancı mevsimlik tarım işçileri de kapsamda değerlendirilmektedir. Sözleşme *Türkiye tarafından onaylanan ILO sözleşmeleri arasında yer almamaktadır.*
1952	Sosyal Güvenlik (Asgari Standartlar) Sözleşmesi	*Türkiye'nin de onaylamış olduğu* sözleşme, sosyal güvenliğe ilişkin belirlenen asgari normlarda yabancılara eşit muamele

		(md. 68) ve mevsimlik tarım işçilerini (md. 24) kapsamaktadır.
1962	Muamele Eşitliği (Sosyal Güvenlik) Sözleşmesi	Sosyal güvenlik ile yardımlar konusunda düzenlemeleri içeren sözleşme *Türkiye tarafından da onaylanmış* olup tüm maddeler yabancı mevsimlik tarım işçileri için de geçerlidir.
1975	Göçmen İşçiler Sözleşmesi	*Türkiye'nin taraf olmadığı sözleşme*, taraf devletlerde bulunan yabancı mevsimlik tarım işçilerinin çalışma koşulları ve bu işçilerin aile fertlerinin sosyal güvenliği bakımından "muamele eşitliğini" vurgulamaktadır.
1975	Göçmen İşçiler Tavsiye Kararı	Mevsimlik yabancı işçiler için iş sağlığı ve güvenliği önlemleri ele alınmaktadır (21, 22. md.).
1982	Sosyal Güvenlik Haklarının Korunması Sözleşmesi	Sözleşme, sosyal güvenlikle ilgili işverenlerin yükümlülüklerini düzenlemektedir ve yabancı mevsimlik tarım işçilerini de kapsamaktadır. *Türkiye bu sözleşmenin tarafı değildir.*
1988	İstihdamı Destekleme ve İşsizliğe Karşı Koruma Sözleşmesi	*Türkiye'nin taraf olmadığı bu sözleşmede*, mevsimlik iş tanımlanmakta çalışma koşulları ve işsizlik durumundaki yükümlülükler anlatılmaktadır.
1997	Özel İstihdam Büroları Sözleşmesi	Özel istihdam büroları tarafından istihdam edilen yabancı mevsimlik işçileri kapsamakla birlikte işçilerin korunması gerekliliği konusundaki hükümlere yer vermektedir. *Türkiye ilgili sözleşmenin tarafı değildir.*
2001	Tarımda Güvenlik ve Sağlık Sözleşmesi	Sözleşmede; tarım sektöründe çalışan işçilerin mesleki hastalık, malullük, iş kazası gibi durumlarda diğer sektörlerde çalışan işçiler ile aynı kapsama alınması gerekliliği ile ilgili hükümlere yer verilmektedir. *Türkiye bu sözleşmenin tarafı değildir.*
2006	Emek Göçüne İlişkin ILO Çok Taraflı Çerçevesi	Hükümler bağlayıcı olmamakla birlikte yabancı mevsimlik tarım işçilerinin sosyal koruma kapsamına alınması konularına yer verilmektedir.
2012	Sosyal Koruma Tabanları Tavsiye Kararı	Yabancı mevsimlik tarım işçileri ve tarım sektöründeki tüm dezavantajlı gruplara temel düzeyde sosyal güvenliğin sağlanması için rehber nitelikte bir karardır.
2015	Kayıtlı Ekonomiye Geçiş Tavsiye Kararı	Kayıt dışı işçiliğin önüne geçilmesi gerekliliği için alınan karar, gelir güvenliği sağlanarak kayıtlı ekonomiye geçiş ile ilgili konuları kapsamaktadır.

Kaynak: NORMLEX, 2022.

3.2. AB Yabancı Mevsimlik Tarım İşçileri Konulu Düzenlemeleri

AB'de genellikle her ülkenin kendine özgü mevsimlik işçi kabul eden yasaları ve düzenlemeleri bulunmaktadır. Fakat 2014'te kabul edilen AB Mevsimlik İşçi Direktifi ile mevsimlik işçilere belirli haklar tanınmış ve üye ülkelerin bu direktife uygun ulusal yasalar çıkarmaları gerektiği bildirilmiştir. AB'nin mevsimlik yabancı tarım işçilerini de kapsayan çalışmaları aşağıda özetlenmiştir.

a. 2007 Adımları: Avrupa Konseyi toplantısında 2007 yılı için iyi yönetilen yasal göç politikalarının geliştirilmesi gerektiği belirtilmiştir. Odak nokta mevcut ve gelecekteki işgücü ihtiyaçlarını karşılamak ve geçici göçü kolaylaştıracak yolları araştırmaktır.

b. Avrupa Göç ve Sığınma Paktı (2008): Üye devletler arasında ve üçüncü ülkelerle iş birliği temelinde ortak bir göç politikası oluşturmayı hedeflemektedir.

c. Stockholm Programı (2009): Bu program işgücü göçünün, ekonomik canlılığı ve rekabet gücünü artırabileceğini kabul etmektedir. Göç politikalarının uzun vadede ekonomik gelişme için kilit olduğunu belirtmektedir. Ayrıca AB topraklarında yasal olarak bulunan üçüncü ülke vatandaşlarına adil muamele yapılmasının önemi vurgulanmaktadır (Saliji, 2018).

3.2.1. AB Mevsimlik İşçi Yönergesi (2014/36/EU sayılı)

Yönerge, Avrupa Parlamentosu ve Konseyi tarafından üçüncü ülke vatandaşlarının tarım, turizm,

inşaat gibi sektörlerde mevsimlik işgücü talebini karşılaması amacıyla düzenlenmiştir. Mevsimlik yabancı tarım işçileri de bu kapsamda olup işçilerin çalışma koşulları, işçi hakları, konaklama koşulları, çalışma izinleri ve üye ülkelere giriş çıkışlarına ilişkin kurallar bu düzenleme ile belirlenmiştir. Yönerge, her üye ülkenin kendi ulusal mevzuatlarına entegre edilmektedir. Uygulanış biçimi ülkeden ülkeye değişmekle birlikte ortak göç politikası ve uyum kriterlerini kapsamaktadır. Bu bağlamda ortak göç politikası, etkin göç akışlarını yönetme ve üçüncü ülke vatandaşlarına adil muamele sağlama amacına yönelik AB'nin ortak göç politikası oluşturmak amacını taşımaktadır. Uyum kriteri ise üye devletlerin, belirli bir zaman dilimi içinde yönergeye uyum sağlayacak yasaları, yönetmelikleri ve idari hükümleri yürürlüğe koymalarını içermektedir. Yönerge kapsamında mevsimlik yabancı tarım işçilerini de kapsayan başlıca düzenlemeler aşağıda verilmiştir (AB, 2014):

- İlgili üye devletin sınırları içinde mevsimlik yabancı işçi olarak çalışmak için bir işveren ile iş sözleşmesi olması ya da bağlayıcı bir iş teklifi olması gerekmektedir. İş sözleşmesinin/teklifinin içeriğinde; işin türü, süresi, ücreti, çalışma saatleri, çalışma koşulları, konaklama durumu ve sigorta kapsamına alınacağının belgeleri yer almalıdır.
- İşveren ve işçi, mevsimlik çalışanın ev sahibi ülkedeki sosyal yardım sistemlerine başvurmadan kendisi hayatını idame ettirebilecek yeterli finansal kaynağa sahip olduğunu belgelemek zorundadır.
- Kamu politikası, güvenlik veya sağlık açısından tehdit oluşturduğu düşünülen bireyler mevsimlik işçi olarak kabul edilmemelidir.
- Üye devletler, başvuran kişinin yasa dışı göç riski oluşturmadığını ve izni sona erdiğinde üye devletlerin toprağını terk etme durumunu değerlendirmelidir.
- Üye devletler, herhangi bir on iki aylık dönemde en az beş ay ve en fazla dokuz ay olacak şekilde bir azami kalış süresi belirlemelidir.

Yönergenin, tüm AB üyesi devletler tarafından cinsiyet, ırk, renk, etnik veya sosyal köken vb. durumlarına bakılmaksızın ayrımcılık yapmadan uygulanması istenmektedir. Fakat ülkeler, üçüncü ülke vatandaşının daha önceki bir konaklama kararına uygun hareket etmediği durumlarda, üye ülke giriş başvurusunu reddetme hakkına sahip olmaktadırlar. Ayrıca yönerge, üye devletlerin mevsimlik işçi kabul etme hacmini belirleme hakkını etkilememektedir (AB, 2014).

3.3. ABD'de Mevsimlik Yabancı Tarım İşçilerine İlişkin Düzenlemeler

Dünya Göç Raporu'na göre ABD, en çok göçmen barındıran bir ülke olarak öne çıkmaktadır (BM, 2020). ABD'nin işgücü konusundaki tarihsel sürecinde de günümüz ile benzer bir yapısı olduğu görülmektedir. Nitekim, uluslararası işgücü göçüyle ilgili ilk kısıtlamalar Amerika tarafından 1921 yılında çıkarılan "Kota Yasası" ile getirilmiştir. Takip eden süreçte, Göçü Sınırlandırma Yasası (1924) ile her yıl sadece 162 bin kişinin göçmen işgücü olarak kabulüne izin verilmiştir (Stalker, 1994). Fakat yabancı işçilerin kaçak yollarla da çalışabildiği bilinmektedir. ABD'de özellikle Meksika'dan gelen göçmenler birçok eyalette tarım işlerinde kayıt dışı çalışmaktadır. Ekonomik rol açısından kaçak göçmen işçiler, ülke tarımının sürdürülebilirliği açısından kritik bir role sahiptir. Bu işçilerin yaptığı işler genellikle yerel işçiler tarafından yapılmak istenmeyen işlerdir. Çoğu zaman düşük ücretle çalışan bu işçilerin durumunu iyileştirmek için birçok düzenleme ve reform çabası olduğu görülmektedir. Bu konuda 1986'da uygulanan Göçmen Reform ve Kontrol Yasası (IRCA), birçok kaçak göçmenin yasal statü kazanmasına olanak tanımıştır (Massey, 2016). Günümüzde ise Migrant and Seasonal Agricultural Worker Protection Act (MSPA), ABD'de mevsimlik tarım işçilerinin çalışma koşullarını düzenlemektedir. Bu yasa işçilerin adil ücret, güvenli konaklama ve ulaşım ile ilgili standartlarını belirlemekle birlikte işçilerin haklarını da korumaktadır (DOL, 2023).

ABD'de göçmen işçi kabulünde, işçilerin niteliklerine ve istihdam alanlarına göre farklı programlar uygulanmaktadır. İşçilerin ülkede çalışabilmeleri için geçici işçi vizesi almaları gerekmektedir. Bu vizeler H-1B, H-2A, H-2B ve H3 olarak sınıflandırılmış olup kapsamları aşağıda belirtilmiştir (USCIS, 2023a; USCIS, 2023b):

H-1B vizesi: Kendi uzmanlık alanında yükseköğrenim derecesine sahip, teorik ve pratik olarak çalışmalar yapmak amacıyla başvuran kişilere verilmektedir. Başvurunun kabul edilmesi için, ABD'de

faaliyet gösteren bir firmadan iş teklifi alınması gerekmektedir.

H-2B vizesi: Geçici veya mevsimlik tarım dışı işçilerin istihdamı amacıyla geçici tarım dışı işlerde çalıştırmak üzere yabancı işçilerin Amerika'ya girişini sağlamak amacıyla uygulanan bir programdır.

H-3 vizesi: Yabancıların tıp ve akademik staj dışındaki alanlarda tarım, devlet, ticaret, iletişim, finans, ulaştırma gibi meslekler ve endüstriyel alanlar da dahil olmak üzere stajyerlik eğitimi almak için ABD'ye seyahat etmelerine imkân tanımak amacıyla oluşturan bir programdır.

H-2A vizesi: Mevsimlik yabancı tarım işçileri için özel olarak oluşturan ayrı bir vize programıdır. Bu program, tarım işletmelerinin yerel işçi bulamamaları durumunda mevsimlik yabancı işçi istihdam edebilmelerine olanak tanımaktadır.

H-2A programı ve bu yasalar, ABD'de mevsimlik yabancı tarım işçilerinin çalışma şartlarını düzenleyen en önemli metinlerdir. İşverenler ve işçiler, bu düzenlemelerin gereksinimlerini yerine getirmekle yükümlüdür.

3.3.1. H-2A Mevsimlik Tarım İşçiliği Vizesi

ABD'nin göç politikaları, tarım politikaları ve insan hakları ile ilgili hükümet düzenlemelerinde mevsimlik yabancı tarım işçileri önemli bir yer tutmaktadır. Amerika Vatandaşlık ve Göçmenlik Bürosu tarafından mevsimlik yabancı tarım işçilerinin ülkede çalışmasına imkân veren H- 2A vizesi programı düzenlenmiştir. Tarımsal üretimde bulunan işletmeler işgücü talebini yerel işçilerden karşılayamadığı durumlarda Vatandaşlık ve Göçmen Bürosu'nun ilgili formlarını doldurarak (I- 129 ve Geçici Yabancı İşçi Başvuru Formu) başvuru yapabilmektedirler. USCIS tarafından her yıl yayınlanan göç istatistiklerine göre 2022 yılında H-2A programı kapsamında 684 bin kişi ülkeye giriş yapmıştır (USCIS, 2023).

H-2A vizesi alabilmek için işverenin Çalışma Bakanlığı'ndan geçici işgücü sertifikası alması gerekmektedir. Başvuru esnasına işverenin diğer yükümlülükleri; mevsimlik tarım işini yapacak yeterli sayıda istekli, nitelikli ve uygun ABD'li tarım işçisi olmadığını ve çalıştıracağı yabancı işçilerin maaş ve çalışma koşullarının ABD'li bir işçi ile eş değer olacağını ispat etmektir. Ayrıca programa başvuracak olan tarım üreticisi işveren, işçilere uygun konaklama ve ulaşım gibi belirli şartları sağlamakla yükümlüdür. Başvurunun onaylanması durumunda gelecek olan işçinin ayrıca H-2A vizesi için başvuru yapması gerekmektedir. H-2A vizesi sadece belirli bir işveren ve belirli bir iş için geçerli olmaktadır. Bu iş dışında başka bir işte çalışılmalarına izin verilmemektedir. Vize tarihinin sona ermesi ile işçinin çalışma hakkı da sona ermektedir. H-2A kapsamında her ülke vatandaşı işçi olarak başvuramamaktadır. ABD İçişleri Bakanlığı tarafından her yıl H-2A'ya uygun ülkeler listesi yayınlanmaktadır. Uygun ülkeler listesi yayınlandığı tarihten itibaren 1 yıl geçerli olmaktadır. Toplamda 3 yıla kadar izin verilmekle birlikte işçiler, eşleri ve 21 yaşın altındaki çocukları için H4 vizesi alabilmektedirler. Ancak vize sahipleri, aile üyelerinin maddi olarak geçimlerini sağlayabileceklerini belgelerle kanıtlamakla yükümlüdür. Türkiye dahil hemen her ülkeden başvuru yapılabilmektedir (Federal Register, 2022; USCIS, 2023).

3.4. Kanada'da Mevsimlik Yabancı Tarım İşçiliği Düzenlemeleri

Geçmişten günümüze kadar olan süreçte yabancı işçiler, Kanada'nın tarım sektörünün önemli bir parçası haline gelmiştir (Caxaj ve Cohen, 2019). Kanada hükümetinin yayınladığı istatistiklere göre tarımda çalışan yabancı işçi sayısı 69.000'den fazla olmakla birlikte bu sayı tarım sektöründe çalışanların yaklaşık %20'sini oluşturmaktadır (Statistics Canada, 2020). Kanada'da mevsimlik yabancı işçi alımına dair düzenlemeler genellikle federal hükümet tarafından belirlenen Göçmenlik ve Vatandaşlık Kanunu, İstihdam ve Sosyal Kalkınma Kanada (ESDC) tarafından yürütülen Geçici Yabancı İşçi Programı (TFWP) başlıkları altında düzenlenmektedir (GOC, 2023). Program, Kanadalı işverenlerin yerel işgücü bulamadıkları durumlarda yabancı işçi istihdam etmelerine olanak

tanımaktadır.

3.4.1. Mevsimlik Tarım İşçisi Programı

Mevsimlik Tarım İşçisi Programı (SAWP), TFWP'nin bir alt programıdır ve Kanada'nın çeşitli bölgelerinde sebze, meyve, süt ürünleri ve balıkçılık gibi mevsimlik tarım işlerinde çalışmak üzere yabancı işçilerin gelme ve çalışma koşullarını düzenlemektedir. Programa göre işveren ve işçilerin yükümlülükleri aşağıda yer almaktadır (Government of Canada, 2021):

- İşverenler çalıştıracakları yabancı işçiler için çalışma izni almak zorundadır. Bu süreçte, işverenlerin, Kanada içinde uygun bir çalışan bulamadıklarını kanıtlamaları gerekmektedir. Ayrıca, işverenler yabancı işçilere uygun çalışma koşulları, konaklama ve diğer sosyal haklar sağlamakla da yükümlüdür.
- Programda, işverenlerin işçileri asgari ücretin altında çalıştıramayacağı hükmü yer almaktadır.
- Çalışmak üzere gelen işçi sadece çalışma izni süresince Kanada'da kalmaya hak kazanır ve bu süre zarfında sadece belirli bir işverenle çalışabilmektedir.
- Programa katılan işçilerin sağlık sigortası ve diğer sosyal yardımlar konusunda da belirli hakları bulunmakla birlikte bu haklar eyalete göre değişiklik göstermektedir.

3.5. Avusturalya'da Mevsimlik Yabancı Tarım İşçiliği Düzenlemeleri

Avusturalya hükümeti, mevsimlik yabancı işçi çalıştırma kapsamında genellikle Pasifik ülkelerinden gelen mevsimlik işçilerin tarımda geçici olarak çalışmalarına izin vermektedir. Bu konuda tarımda geçici işçi ihtiyacını karşılamak amacıyla oluşturulan özel programlar aşağıda yer almaktadır. Her bir programın özel şartları bulunmakla birlikte bu programlar ile işçilerin hakları güvence altına alınmakta ve çalışma koşulları belirlenmektedir (Curtain and Howes, 2020).

3.5.1. Mevsimlik İşçi Programı (SWP)

Avustralya'da tarım sektörünün hızla büyüme göstermesi nedeniyle giderek artan sayıda geçici işçiye ihtiyaç duyulmaktadır. Yerel işçilerden işgücü ihtiyacı karşılanamaması nedeniyle ülke mevsimlik yabancı tarım işçisi göçü almaya başlamıştır. Kaçak işçi göçünü önlemek amacıyla Avusturalya Hükümeti, Pasifik Adaları ülkeleri ile iş birliği çerçevesinde Mevsimlik Çalışma Programı'nı (Seasonal Worker Program-SWP) 2012 yılında uygulamaya başlamıştır. Program, tarım sektöründe mevsimlik işçi ihtiyacını karşılamak için tasarlanmıştır. Bu program kapsamında Papua Yeni Gine, Tonga Vanuatu, Fiji, Samoa, Solomon Adaları ve Kiribati gibi Pasifik Adaları ülkelerinden işçiler Avusturalya'ya gelerek mevsimlik tarım işlerinde çalışabilmektedirler. Başlangıçta program sadece; bahçecilik, su ürünleri yetiştiriciliği, pamuk ve şeker kamışı yetiştiriciliği alanlarında pilot olarak uygulanmış ve yıllık 12 bin yabancı işçinin ülkeye girişine izin verilmiştir. Fakat 2015 yılından itibaren 12 bin işçi sınırlandırması kaldırılmıştır (GSP, 2021). Programın başlıca katılım şartları aşağıda yer almaktadır (Australian Government, 2023a):

- Başvuru için geçerli bir pasaport, vize başvurusu ve iş teklif mektubu gerekmektedir. Genellikle 21-45 yaş arasındaki işçilerin başvuruları kabul edilmektedir.
- Başvuran kişinin belirli sağlık şartlarını karşılaması gerekmektedir ve bu durum başvuru aşamasında bir sağlık muayenesi ile teyit edilmektedir.
- Vize süresi işin türüne göre değişmekle birlikte en fazla 9 aylık süre için verilmektedir.
- Program genellikle işçinin ailesini beraberinde getirmesine izin vermemektedir.
- Bazı işler için İngilizce bilme şartı ve deneyim aranmaktadır.
- İşverenler Avustralya standartlarında iş sunmayı garanti etmek zorundadır.

3.5.2. Pasifik Çalışma Programı (PLS)

Pasifik Çalışma Programı (Pasific Labor Scheme-PLS), Avustralya'nın Pasifik Adaları ülkeleri ile yapılan iş birliği çerçevesinde yürütülen bir programdır. Bu programın SWP'den farkı, belirli sektörlerde (tarım ve hizmet sektörleri gibi) yetenekli yabancı işçilere uzun dönemli çalışma imkânı

sunmasıdır. Bu programda da SWP'de olduğu gibi pasaport ve vize, sağlık durumu kontrolü, iş teklifi, işin türüne göre İngilizce bilgisi, deneyim vb. şartlar aranmaktadır. Program işçilere 1 ila 3 yıl arasında bir süre için Avustralya'da çalışma izni vermektedir. İzin süresi işveren, işin türü ve diğer faktörlere bağlı olarak değişebilmektedir. Ayrıca bu süre boyunca işçilerin belirli şartlar altında iş değiştirmelerine izin verilebilmektedir (Australian Government, 2023c).

Mevsimlik Tarım İşçi Programı ve Pasifik Çalışma Program'larının tamamını kapsayacak ve tek bir Pasifik-Avustralya İşgücü Hareketliliği (PALM) Sözleşmesi için çalışmalar yapılmıştır. Program Haziran 2023 tarihinde Avustralya Hükümeti'ne sunulmuş olup Temmuz 2023 sonrasında yürürlüğe girmesi planlanmıştır. Geçiş dönemini yönetmek için 16 Haziran 2023 tarihinden itibaren SWP ve PLS başvurusu alınmaması kararlaştırılmıştır (Australian Government, 2023b; PALM, 2023).

3.6. Birleşik Krallık'ta Mevsimlik Yabancı Tarım İşçiliği Düzenlemeleri

3.6.1. Mevsimlik Tarım İşçileri Programı (SAWS)

Seasonal Agricultural Worker Scheme (SAWS) olarak yayınlanan program, ağırlıklı olarak Bulgaristan ve Romanya'dan Birleşik Krallık'a (BK) tarım sektöründe çalışmak üzere gelen işçi akışını düzenlemek amacıyla oluşturulmuştur. Uygulanma tarihi 1945-2013 yılları arasında olup 2019 yılında yeniden uygulanmaya başlanmıştır. BK'de tarım işletmeleri nitelikli, güvenilir, maliyet-etkin işçiler bulmakta zorlanmaktadır. Bu program ilk yıllarda Avrupa'daki genç öğrencilerin tarım sektöründe çalışmalarını teşvik etmek amacıyla bir kültürel değişim programı olarak kurulmuştur. Zamanla bu program tarım sektöründeki işgücü taleplerini karşılamak amacıyla kullanılan bir program haline gelmiştir. SAWS, 1990 yılından itibaren günümüzdeki formu ile faaliyete geçmiş ve yıllık 5.500 iş izni kotası ile altı ay süre sınırı konulmuştur. Kota miktarı zaman içinde değişim göstermiştir (2004 yılında 25.000'e kadar çıkmıştır) ve işgücü kaynağı ülkeler zamanla sadece Bulgaristan ve Romanya'ya indirgenmiştir. Bu program kapsamında işçiler, tek taraflı olarak işveren değiştirememektedirler. Fakat asgari ücret, ücretli tatil ve hastalık ücreti gibi haklara sahip olmakla birlikte konaklama ve ulaşım giderleri de karşılanmaktadır. Bulgaristan ve Romanya'nın 2013 yılında serbest dolaşım haklarına sahip olmasının ardından programın uygulanmasına son verilmiştir. Bu tarihten itibaren tarım sektöründe işçi açığının oluşmaya başlamasıyla yeni bir pilot program uygulanmaya başlamıştır. Program kapsamında, 2020 yılında yılda 10.000 işçi ve 2021 yılında yılda 30.000 işçi çalışmak üzere BK'ye getirilmiştir. Program günümüzde İçişleri Bakanlığı tarafından yürütülmeye devam edilmektedir fakat sadece sebze ve meyve üretim işletmelerinde mevsimlik çalışmayı kapsamaktadır. İşçiler ağırlıklı olarak Ukrayna ve Moldova'dan temin edilmekte olup Barbados, Belarus, Fas, Romanya ve Rusya'yı da kapsaması planlanmaktadır (CGD, 2021).

3.6.2. Mevsimlik İşçi Vizesi (SWS)

Mevsimlik İşçi Vizesi (Seasonal Worker Visa-SWS), özellikle tarım ve balıkçılık sektörlerinde mevsimlik işçi ihtiyacını karşılamak için tasarlanan bir programdır. Bu vize kapsamında BK ülkelerinde çalışabilmek için kabul ve süre ile ilgili şartlar aşağıda yer almaktadır (UK, 2023):

- Göçmen işçi çalıştırmak için lisans sahibi bir işverenden alınacak iş teklifi gerekmektedir. İşverenler, bu program kapsamında ülkeye işçi getirebilmek için işçinin uygun barınma koşullarını ve minimum ücret sağlamayı taahhüt etmelidir. Yapılacak olan işin nitelikleri, iş yerine ait bilgiler, yabancı işçinin nitelikleri, çalışma süresi ve ücret gibi unsurlar vize başvurusu yaparken belirlenmelidir.
- Vize başvurusunun onaylanmasının ardından işçiler en fazla 6 ay BK'de çalışabilmektedirler. Ancak sponsorluk sertifikasını sağlayan işveren "çoklu giriş sertifikası"na başvuru yapıp onaylanır ise kalış süresi 1 yıl içinde 6 ayı geçmeyecek şekilde birden fazla kez uzatılabilmektedir.
- Mevsimlik işçiler sadece tek bir işveren ile çalışabilmektedirler ve bu program kapsamında ailelerini yanında getirme hakkına sahip değildirler.
- İşçiler ülkede konakladığı süre boyunca sağlık hizmetlerine erişme hakkına sahip olmakla birlikte sosyal yardımlara erişim hakları bulunmamaktadır.

3.7. Meksika'da Mevsimlik Yabancı Tarım İşçiliği Düzenlemeleri

Meksika'dan, ABD ve Kanada'ya çok fazla yabancı işçi göçü olmaktadır. Meksika hükümeti ülkeden göç eden işçilerin haklarını korumak amacıyla kendi iç yasal düzenlemelerinin yanı sıra uluslararası anlaşmalar da yapmaktadır. Tarım sektöründe çalışmak üzere Meksika'dan Kanada'ya yoğun bir şekilde yabancı mevsimlik tarım işçi göçü olması nedeniyle Meksika ile Kanada arasında aşağıda detayları açıklanan özel bir program uygulanmaktadır.

3.7.1. Geçici Tarım İşçileri Programı

Geçici Tarım İşçileri Programı (Programa de Trabajadores Agrícolas Temporales), Kanada topraklarında yer alan tarım işletmelerinde çalışacak olan Meksikalı işçilerin, çalışma koşullarını belirlemek amacıyla düzenlenmiştir. Bu program, Kanada'nın tarım sektöründe mevcut işgücü açığını doldurmayı amaçlamakla birlikte Meksika vatandaşlarına da yüksek gelir elde etme fırsatı sunmaktadır. Meksika-Kanada Geçici Tarım İşçileri Programı, Meksika ve Kanada Hükümetleri arasında 1974 yılında imzalanan anlaşma sonrasında başlatılmıştır. Program, her iki hükümet arasındaki ikili ilişkileri geliştirmeye katkıda bulunmuş olup aynı zamanda uluslararası işgücü iş birliği için bir model oluşturmuştur. Program ile düzenli ve insan onuruna yakışır işçi göçü sağlama koşulları oluşturulmuştur. Programın bir parçası olarak işleyişe dahil olan Meksika ve Kanada'nın farklı hükümet kurumları (hem federal hem de eyalet düzeyinde); Ontario, Quebec ve Britanya Kolombiya'sı işveren derneklerinin temsilcileriyle yıllık değerlendirme toplantıları düzenlemektedir. Program, işçilere belirli bir süre için Kanada'ya gitme ve orada çalışma fırsatı sunmaktadır. İşçiler genellikle belirli bir tarım sezonu için oradadırlar ve çalışma süreleri ürünün türüne ve hasat zamanına bağlı olarak değişkenlik gösterebilmektedir. İşveren, işçilere asgari ücret, konaklama, sağlık sigortası ve diğer temel ihtiyaçlar gibi bazı temel haklar sağlamakla yükümlüdür. Bu tür programlar genellikle iki ülke arasında yapılan resmi anlaşmalarla düzenlenmekte ve her iki ülkenin de yasal gereksinimlerine uygun olarak işletilmektedir (GOB, 2020).

3.8. Türkiye'de Mevsimlik Yabancı Tarım İşçiliği Düzenlemeleri

Diğer ülkelerde olduğu gibi Türkiye'de de yerel işgücü kaynaklarından işgücü talebi karşılanamadığında mevsimlik yabancı işçi istihdam edilmektedir. Türkiye'de tarımda mevsimlik tarım işçisi taleplerine bakıldığında genellikle ülke içinden göç eden işçiler ile işgücü ihtiyacı karşılanmakta olduğu görülmektedir. Fakat son yıllarda ülkede bulunan sığınmacı, mülteci ve göçmenlerin artmasıyla birlikte yabancı işçilerin sayısı da gün geçtikte artmaktadır. Türkiye'ye gelen göçmenlerin bir kısmı tarımsal üretimde çalışmakta ve tarım sektöründe bazı işlerde yerel emeğin yerini almaktadır. Gürcü, Azeri ve Suriyeli işçiler belli tarımsal ürünlerin üretiminde ve belli coğrafi bölgelerde ücretli tarım işçilerinin asıl işçileri haline gelmiştir (Dedeoğlu, 2018).

Mevsimlik yabancı tarım işçilerinin çalışma şartları, kabulü ve hakları ile ilgili spesifik düzenlemeler bulunmamakla birlikte kapsayıcı düzenlemeler aşağıdaki bölümlerde açıklanmaktadır. Türkiye'de çalışmak isteyen yabancı işçiler, belirli yasal düzenlemelere uymak zorundadır. Bu düzenlemeler, işçilerin çalışma izinlerini ve diğer gerekli belgelerini almasıyla ilgili prosedürleri içermektedir.

3.8.1. 6735 Sayılı Uluslararası İşgücü Kanunu'nda mevsimlik yabancı işçiler

Türkiye'de yabancı işçi çalıştırılması konusunda en temel mevzuat olup ilgili düzenlemelerden sorumlu kuruluşlar; Çalışma ve Sosyal Güvenlik Bakanlığı (ÇSGB), İçişleri Bakanlığı, Sağlık Bakanlığı gibi devlet organlarıdır. Uluslararası İşgücü Kanunu'nun amacı; uluslararası işgücüne ilişkin politikaların belirlenmesi, uygulanması, izlenmesi ile yabancılara verilecek çalışma izni ve çalışma izni muafiyetlerine dair iş ve işlemlerde izlenecek usul ve esasların belirlenmesidir (RG, 2016a).

a. Yabancı işçilik başvurusu ve değerlendirilmesi

- Başvurular yurt içinde doğrudan ÇSGB'ye, yurt dışında ise yabancının bulunduğu ülkedeki Türkiye Cumhuriyeti Büyükelçilikleri veya Başkonsolosluklara yapılmaktadır. Çalışma izni uzatma başvurusu çalışma izni süresi dolmadan yapılmaktadır. Bakanlık tarafından, Uluslararası İşgücü

Politikası Danışma Kurulu kararları doğrultusunda çalışma izni başvurusunun değerlendirilmesinde ve çalışma izni puanlama sisteminin oluşturulmasında kullanılacak kriterler belirlenmektedir (md. 7)

- Mesleki yeterlilik gerektiren sağlık ve eğitim ilgili Bakanlıklardan, hizmetlerinde çalışacak yabancıların çalışma izni başvurularının değerlendirilmesinde ön izin alınması zorunludur (md. 8).
- Başvuru kabulünden sonra belirli bir işte çalışmak koşuluyla en fazla 1 yıl çalışma izni verilmektedir. Uygun şartlar sağlandığında bu izin 3 yıla kadar uzatılabilmektedir (md. 10).
- Bilim ve teknolojiye katkı amacıyla, Uluslararası İşgücü Politikası Danışma Kurulu önerileri ve Bakanlıkça belirlenen usul ve esaslara göre başvurusu uygun görülen yabancılara Turkuaz Kart verilmektedir. Bu kartın geçerlilik koşullarında ilk 3 yıl geçiş süresi statüsündedir. Kartın geçiş sürecinde iptal edilmemesi durumunda yabancı çalışanın başvurusu halinde süresiz Turkuaz Kart verilmektedir (md. 11). Mevsimlik yabancı tarım işçileri bu kapsamda değildir ve geçici koruma sağlanan yabancılara bu madde hükümleri uygulanmamaktadır.

b. Kanun'da yabancı işçi çalıştırma kriterleri

- Ücret, işin türüne göre değişmekle birlikte yabancı işçiler asgari ücretin altında çalıştırılamamaktadır.
- Çalışma izni talep eden işyerinin en az 5 tane Türk vatandaşı istihdam etmesi gerekmektedir ve aynı iş yerinde birden fazla yabancı işçi var ise her bir yabancı işçi için 5 Türk vatandaşı istihdam etmelidir.
- İşletmenin belirlenen minimum miktarlarda öz sermayesi, brüt satış miktarı ve ihracat tutarı olması gerekmektedir.
- Başvurularında kriter uygulanmayacak yabancılar; Kuzey Kıbrıs Türk Cumhuriyeti (KKTC) vatandaşları, en az 3 yıl olmak üzere Türk vatandaşı ile evli olanlar, Türk ve akraba toplulukları uygulamaları çerçevesinde ikamet izni verilmiş olanlar, annesi, babası veya çocuğu Türk vatandaşı olanlar, insani mülahazalar çerçevesinde ikamet izni verilmiş olan yabancılar, insan ticareti mağduru olup ikamet izni verilenler, vatansız statüsünde ikamet iznine sahip olan yabancılar olarak belirlenmiştir (ÇSGB, 2023a).

3.8.2. 6458 Sayılı Yabancılar ve Uluslararası Koruma Kanunu

Kanun, 2013 yılında yürürlüğe girmiş olup yabancıların ve uluslararası koruma başvurusunda bulunanların yasal statülerini belirlemektedir. Kanun'a göre 61. maddede tanımlanan mülteci statüsü sahibi yabancının Göç İdaresi Başkanlığı'nca verilecek kimlik belgesi çalışma izni yerine geçmektedir. Bu statüleri kazanmış kişiler söz konusu kimlik belgesiyle Türkiye'de çalışabilmektedirler. Şartlı mülteci olarak tanımlanan yabancılar ise (62. md.), uluslararası koruma başvuru tarihinden 6 ay sonra çalışma izni başvurusunda bulunabilmektedirler. Uygun bulunması halinde şartlı mülteciler Türkiye'de çalışabilmektedir. Yine aynı Kanun'da "koruma altındaki yabancı" olarak tanımlanan yabancıların (63. md.) aldıkları kimlik belgesi çalışma izni yerine geçmekte ve Türkiye'de çalışabilmektedirler (RG, 2013; ÇSGB, 2023b). Söz konusu çalışma izinleri için tarım sektörü ayrıca belirtilmemiştir.

3.8.3. Uluslararası İşgücü Kanunu (No: 6735) Uygulama Yönetmeliği

Yönetmelik, Uluslararası İşgücü Kanunu kapsamında yabancı işgücüne ilişkin politikaların belirlenmesi, uygulanması ve izlenmesi ile çalışma izni ve muafiyetler konusunda izlenecek usul ve esasları belirlemek amacıyla yürürlüğe konulmuştur. Yönetmelik'te yer alan "Çalışma İzni Muafiyeti" bölümünde, Uluslararası İşgücü Genel Müdürlüğü tarafından belirlenen mevsimlik tarım ve hayvancılık işlerinde çalışacak yabancılar altı aya kadar çalışma izninden muaftır ibaresi yer almaktadır (RG, 2022).

3.8.4. Geçici Koruma Sağlanan Yabancıların Çalışma İzinlerine Dair Yönetmelik

Geçici Koruma Yönetmeliği'nin 29. maddesine dayalı olarak 2016 tarihinde çıkarılan bu yönetmeliğin amacı, geçici koruma sağlanan yabancıların çalışmalarına ilişkin usul ve esasların belirlenmesidir. Yönetmeliğe göre, mevsimlik tarım veya hayvancılık işlerinde çalışacak geçici koruma sağlanan yabancılar, çalışma izni muafiyeti kapsamındadır. Çalışma izni muafiyeti başvuruları, geçici

koruma sağlanan il valiliğine yapılmaktadır. Bu başvurular, ilgili valilik tarafından Bakanlığa bildirilmektedir. Gerekli görüldüğü durumlarda Bakanlıkça mevsimlik tarım veya hayvancılık işlerinde çalışacak geçici koruma sağlanan yabancılara ilişkin il ve kota sınırlaması getirilebilmektedir (5. md.) (RG, 2016b).

4. TARTIŞMA

Çalışmadan elde edilen bulgular mevsimlik yabancı tarım işçileri özelinde ülkelerin uygulamalarını, hukuki düzenlemelerinin çerçevesini ve bu konudaki politikalarını kapsamlı bir şekilde ortaya koymuştur. Bu bağlamda uluslararası düzenlemelerin etkisi, öne çıkan ülkelerde yapılan düzenlemelerin değerlendirilmesi, Türkiye'deki düzenlemelerin kapsamı ve diğer ülkelerle karşılaştırılması aşağıda yer almaktadır.

a. Mevsimlik Yabancı Tarım İşçiliği ile İlgili Uluslararası Düzenlemelerin Etkisi

AB ve ILO yaptığı düzenlemelerle mevsimlik yabancı tarım işçilerinin hakları, çalışma ve barınma koşulları, sosyal güvenlik hakları konusunda asgari standartlar getirmektedir. ILO Göçmen İşçiler Sözleşmesi (1975) ve AB Mevsimlik İşçi Direktifi (2014) bu bağlamda yabancı işçilerin korunmasına yönelik önemli düzenlemelere yer vermektedir. Ancak, bu düzenlemelerin bağlayıcılığı ve uygulamadaki denetim eksiklikleri istenilen sonuçlara ulaşılmasında sorun teşkil etmektedir. Konuyla ilgili yapılan diğer çalışmalarda da bu sorunlara dikkat çekilmektedir. Örneğin, AB'nin mevsimlik yabancı tarım işçileri konusunda yaptığı düzenlemelerde, yönergelerin ulusal düzeyde yasalarla uyumlaştırılması süreçlerinde üye ülkelerin kendi önceliklerine odaklanması uygulamada ayrışmalara yol açmaktadır (Saliji, 2018). Türkiye ve diğer ülkelerin de ILO'nun belirli sözleşmelerine taraf olmaması belirlenen standartların ülkeler bağlamında ülke genelinde uygulanabilirliğini sınırlamaktadır.

b. Mevsimlik Yabancı Tarım İşçiliği ile İlgili Düzenlemelerin Ülkeler Bazında Değerlendirilmesi

ABD, Kanada, Avustralya ve Birleşik Krallık'ta mevsimlik yabancı tarım işçileri özelinde özel vize programları bulunmaktadır. Bu ülkelerin amacı, tarım sektöründe geçici iş gücü ihtiyacını karşılamayı kolaylaştırırken göç eden yabancı işçileri koruyacak mekanizmalar geliştirmektir. ABD'de uygulanan H-2A Vize Programı ve Kanada'da uygulanan SAWP, tarım sektöründe yabancı işçi istihdamını yasal bir çerçevede düzenlerken ücret, barınma ve sosyal güvenlik hakları gibi kritik konuları kapsayan benzer standartlar getirmektedir. Fakat mevsimlik tarımda kayıt dışı çalışmanın yaygınlığı ve işçilerin çalışma standartlarına ilişkin sorunlar devam etmektedir. Özellikle ABD'de, Meksikalı işçilerin düşük ücret aldığı ve büyük oranda kayıt dışı çalıştıkları bilinmektedir (Massey, 2016). Bu durum, ilgili düzenlemelerin uygulamada etkin bir denetimle desteklenmesi gerekliliğini ortaya koymaktadır.

c. Türkiye'de Mevsimlik Yabancı Tarım İşçiliği Konusunda Yapılan Düzenlemelerin Diğer Ülkeler ile Karşılaştırılması

Tarım sektöründe işgücünde yer alan mevsimlik yabancı işçiler için Türkiye'de ve diğer ülkelerde yasal düzenlemeler yapılmakla birlikte uygulamada farklılıklar bulunmaktadır. Diğer ülkelerle karşılaştırıldığında Türkiye'de mevsimlik yabancı tarım işçiliği kapsamında özel bir düzenleme bulunmaması dikkat çekmektedir. Türkiye'de mevcut düzenlemeler işgücü ve göç ile ilgili genel hukuki metinler kapsamında yer almaktadır. Uluslararası İşgücü Kanunu ve Geçici Koruma Sağlanan Yabancıların Çalışma İzinlerine Dair Yönetmelik'te yer alan bu düzenlemelerin yabancı mevsimlik tarım işçileri özelinde kapsamının genişletilmesi gerekmektedir. ABD ve Kanada'da uygulanan tarım sektöründe çalışmaya yönelik özel vize programları mevsimlik tarım yabancı tarım işçiliği kapsamında önemli düzenlemelerdir. Bu uygulamaların incelenerek Türkiye'de uygulanan "çalışma izni muafiyeti" düzenlemelerinin kayıt dışılığı önleyecek şekilde yeniden yapılandırılması, Kanada ve Meksika'nın ikili anlaşmalarla belirlediği yapılanmanın model alınarak göç yönetimini ulusal ve uluslararası düzenlemelerle desteklemesi önem arz etmektedir.

5. SONUÇ VE ÖNERİLER

Yabancı mevsimlik tarım işçiliği konusu Türkiye'de olduğu gibi dünyada da üzerinde önemle durulan iş hukuku düzenlemelerindendir. Bu konuda ulusal ölçekli yasal düzenlemeler yanında konunun

önemi nedeniyle uluslararası da çeşitli anlaşmalar ve sözleşmeler bulunmaktadır. Gerek dünya örnekleri ve gerekse Türkiye uygulaması birlikte dikkate alındığında öne çıkan sonuç bulguları olarak şunlar söylenebilir:

a. Genellikle tüm ülkeler uluslararası işgücü ile ilgili hukuki düzenlemelerinde mevsimlik işçi göçü konusunda hükümlere yer vermektedir. Fakat bu çalışma kapsamında ele alınan ülkeler mevsimlik işçi konusunda genel hukuki düzenlemelerinin yanı sıra mevsimlik yabancı tarım işçiliği özelinde programlar geliştirmişlerdir.
b. Mevsimlik yabancı işçi kapsamında yapılan düzenlemeler genellikle tarım, konaklama veya inşaat gibi belirli sektörlerde geçici işgücü açıklarını doldurmak üzere tasarlanmış devlet tarafından yürütülen girişimlerdir. Bu programlar işverenlere, genellikle mevsimsel talebi karşılamak üzere, belirli bir dönem için yabancı işçi çalıştırma olanağı sağlamaktadır.
c. Her bir programın kendine özel gereklilikleri ve başvuru prosedürleri bulunmaktadır. Programlar, incelenen hukuki dokümanlara göre genellikle; "belirlenmiş zaman dilimi", "çalışma izinleri" ve "ücret düzenlemeleri" başlıkları altında yer alan hükümlerden oluşmaktadır.
d. Mevsimlik yabancı tarım işçiliği kapsamındaki programlar, işgücü arzı ve talebini dengelemek için değerli araçlardır. Ancak bu konuda düzenlenen kabul programlarının hem gönderen hem de alan ülkeler açısından faydalı olabilmesi için etkin bir denetlemeye ihtiyacı bulunmaktadır. Nitekim denetim eksikliği işçilerin istismar edilmesine yol açabilmektedir. Devletler arası iş birliği ve yerel denetimler, bu istismarın önüne geçilmesinde büyük önem arz etmektedir.
e. Türkiye'de mevsimlik yabancı tarım işçiliği özelinde ayrı bir düzenleme yapılmamış olup ilgili düzenlemeler uluslararası işgücü ile ilgili belli hukuki dokümanların içinde yer almaktadır. Türkiye'de bulunan yabancı nüfus göz önüne alındığında bu konuda ayrı bir ülke stratejisi belirleme ihtiyacı ortadır.

Öneriler:

a. Türkiye'de mevsimlik yabancı tarım işçilerinin çalışma izni süreleri, denetimi, ücret ve sosyal güvelik durumlarını kapsayan özel hukuki düzenlemelerin geliştirilmesi ve tarımsal üretimin yoğun olduğu bölgelerde yerel ihtiyaçlara uygun bir şekilde uygulanması,
b. Yoğun göç alınan ülkelerle işçilerin haklarını ve işverenlerin sorumluklarını netleştiren ikili işgücü anlaşmalarının yapılarak işçi akışının etkin yönetilmesi,
c. Mevsimlik yabancı tarım işçilerinin işçilerin uyum süreci ve kültürel adaptasyonu açısından faydalı olacak Türkçe eğitimi programları düzenlenerek Türkçe bilme kriteri getirilmesi,
d. Güvenlik veya sağlık açısından tehdit oluşturduğu düşünülen bireylerin mevsimlik işçi olarak kabul edilmemesi,
e. Türkiye'nin coğrafi konumu gereği yoğun olarak göç aldığı ülkeler ile ikili anlaşmalar ile iş birliği yapılarak göç sürecinin daha etkin yönetilebileceği ve tarım sektöründe sürdürülebilir bir işgücü modeli teşvik edeceği öngörülmektedir.

Bu çalışma, mevsimlik yabancı tarım işçiliği konusunda yapılan düzenlemelerin kapsamlı bir değerlendirmesini sunmaktadır ancak Türkiye'de bulunan mevsimlik yabancı tarım işçiler konusunda kapsamlı saha araştırmalarını da kapsayan daha fazla çalışmaya ihtiyaç bulunmaktadır.

Araştırmacıların Katkı Oranı Beyan Özeti

Yazarlar makaleye eşit katkıda bulunduklarını beyan ederler.

Çıkar Çatışması Beyanı

Yazarlar aralarında herhangi bir çıkar çatışması olmadığını beyan etmişlerdir.

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