



TODAY'S
Seed

FUTURE'S
Agriculture

IMECE WORKSHOPS

SEED

June 2023

İstanbul



CONTENTS

WORKSHOP OPENING SPEECHES	6
WORKSHOP FLOW	8
Participants.....	8
Programme.....	10
REPORT METHODOLOGY.....	11
ENVIRONMENTAL FACTORS.....	12
SOCIAL FACTORS.....	14
GOVERNANCE FACTORS.....	18
HIGHLIGHTS	28
ABOUT SUSTAINFINANCE	30

INTRODUCTION

The fourth of the Imece Workshops, which İşbank started to organize with the EFSE Development Facility and Frankfurt School of Finance & Management within the scope of its activities in agriculture, was held with the theme of "**Seed**".

Public and private sector officials, leading farmers, academicians, trade exchanges, agricultural cooperatives, union representatives and agricultural technology entrepreneurs came together at the Seed Workshop held in İstanbul on 9 June 2023 with the slogan " Today's Seed, Future's Agriculture".

At the workshop, methods for ensuring sustainability and increasing efficiency in seeds under changing climate conditions, research and development activities in the field of seeds, the future of agriculture, and steps that can be taken in the field of seeds for sustainable agriculture were discussed.

FINDINGS

Seed production is critical for ensuring food security in an increasingly crowded world. The search for durability, productivity, and quality in the field of seed is gaining more importance day by day. It is predicted that climate change and population growth pressure will bring seed and, therefore, seed production to an even more strategic position in the future.

Breeding studies conducted with new technologies in the field of seeds, taking into account changing climate conditions, are of great importance for ensuring sustainability in terms of food security.

Below are the prominent findings related to seed breeding¹:

According to the data for 2022, global seed trade has a volume of 50 billion USD, with the United States leading with 12 billion USD and China following closely with 10 billion USD. Turkey ranks 11th with a volume of 750 million USD.

- Total certified seed production in our country was 145 thousand tonnes in 2002. Production increased 9.4 times to approximately 1.4 million tonnes in 2022. Seed production consists roughly of 35 percent of potato, 33 percent of wheat, and 12 percent of barley seeds.
- In 2022, 12% of certified seed production in Türkiye was carried out by the public sector and 88% by the private sector.
- When examining foreign trade data for the past 12 years, it can be seen that in 2022, for the first time, seed exports exceeded seed imports in terms of value. Thus, the ratio of exports to imports was 30 percent in 2002, reaching 137 percent in 2022.
- When the distribution of registered seed varieties in Türkiye is analyzed, it is seen that the private sector has a 78% share, the public sector has a 21% share, and universities have a 1% share.
- In our country, 37% of the registered seed varieties are domestic, and 63% are foreign.
- Of the seed companies in Türkiye, 94% are domestic, 4% are foreign and 1% are local-foreign capital partnerships.
- The rates of foreign dependency in 4 main cost items in agricultural production are given below and it is seen that foreign dependency in seed varies according to the type of seed:

1 Turkish Seed Association, Seed Sector Report-2023

- Fossil fuels :92%
- Fertiliser production :90%
- Pesticide chemicals :85%
- Seed :According to the product type 0-100%

Within the workshop's scope, the issues raised by the participating stakeholders were listed under the headings of "Environmental, Social and Governance", including financial and non-financial "Problems and Solution Suggestions".

The "Highlights" section encompasses the steps recommended in the short, medium, and long term to address the concerns outlined in this report.

WORKSHOP OPENING SPEECHES

İZLEM ERDEM

Türkiye İş Bankası A.Ş.

Deputy Chief Executive

As seed production has become a critical issue for ensuring food security for the ever-increasing world population, the search for **durability, efficiency and quality** in the seed field has gained more importance.

We consider seed production as **a strategic and national issue**. The rich biodiversity of our country, which is the gene center of many species in the agricultural sector, is promising for the future.

We observe that our country has made positive developments in seed over the years. The 145 thousand tonnes of certified seed production in 2002 increased 9.4 times to approximately 1.4 million tonnes in 2022. The recent development of the balance between imports and exports in favor of exports is also very positive for us. When we analyze foreign trade data, we see that the ratio of exports to imports was 30 while it increased to 137 percent in 2022.

"R&D activities should be handled with a holistic perspective"

R&D activities are the most important factor for the development of the seed sector in our country. Plant breeding studies, seed science and seed technologies research are extremely important in this respect. We believe R&D activities in seed science and seed technologies should be supported with long-term investments. Our country's ability to mobilize its potential in the field of seed depends **on a holistic approach to R&D activities**.

We will continue to stand by agriculture and our farmers with our initiatives in the field of agriculture, such as our specialized agricultural branches and venture acceleration programs, by taking power from technology for a sustainable future.

İBRAHİM OĞUZ

**Frankfurt School of Finance & Management
Agricultural Field Research Group Manager**

"Seed production will become more strategic"

The seed sector in our country has reached an important point in the last 35 years. While it is observed that the effects of seed production on agricultural production and our economy are improving every year, more work needs to be done in this field.

With climate change and increasing population pressure, seed production will become even more strategic in the future. In addition to public-private sector collaboration, financial institutions also need to understand the industry to reduce the dependence on external sources in the seed industry and improve competitiveness in global conditions.

OĞUZ BARDAK

**EFSE Development Facility
Investment Manager**

"We facilitate access to finance in agriculture"

Sustainability and access to finance are central to EFSE's values and investment strategy. To achieve this goal, we prioritize rural areas in both Turkey and the other 15 countries where we operate and we aim to facilitate access to finance in the agricultural sector, primarily supporting farmers and micro and small businesses. It is very important for us to organize this workshop in partnership with Türkiye İş Bankası, where the following issues are at the forefront: ensuring the sustainability of our country's food supply security, increasing the resilience of the agricultural sector against climate change and reducing carbon emissions.

WORKSHOP FLOW

Participants

	İsim / Soyisim	Kurum
1	Abdullah Tayyar Demir	May Seed - Marketing Manager
2	Abdullahveli Yıldırım	Tekfen - Assistant Agriculture Manager
3	Ahmet Tuğrul Başer	Birlik Tohumculuk -Company Manager
4	Akanay Gülkanat	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
5	Aksu Çuğ	Akcansev Aksu Farm - Company Founder
6	Aykut Özbuğday	Progen Seed - CEO
7	Bayram Sade	National Grain Council - Board Member
8	Buket Sakmanlı Apaydın	Sub-union of Seed Industrialists and Producers - Agriculture Writer
9	Burak Samur	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
10	Burcu Karpuz	Finance In Motion - Investment Manager
11	Çiğdem Çakmak	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
12	Derman Eser	Utek Agriculture Seed
13	Dilber Altınörs	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
14	Doç. Dr. Hakan Fidan	Akdeniz University - Academician
15	Doç. Dr. Selma Onarıcı	TUBITAK Mam Life Sciences - Vice President
16	Doç.Dr. Hamit Ayanoğlu	Seed Industrialists and Producers Sub Union - Secretary General
17	Dr. M. Mete Kömeağaç	Akdeniz Seed - Chairman of the Board of Directors
18	Dr. Şerafettin Çakal	TAGEM - Deputy General Manager
19	Dr.Erhan Ekmen	Agricultural Journalists and Writers Association (TAGYAD) - Vice President
20	Ebru Kaçın	EYT Tohumculuk – Founding Partner
21	Emrah İnce	Technology Development Foundation of Turkey (TTGV) Climate Technologies Ambassador
22	Ertuğrul Ünlü	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
23	Gaffar Öney	Türkiye İş Bank Inc. SME Banking Sales Department Manager
24	Galip Umut Özdil	Turkish Seed Growers Association - Press Consultant
25	Hasan Turan	Leader Farmer
26	Haslet Gemici	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
27	Hatice Erkiletlioğlu	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
28	Hikmet Öztürk	Department of Tema - Deputy General Manager

29	Hurşit Nallı	Sapling Producers Sub-union - Chairman of the Board of Directors
30	İbrahim Oğuz	Frankfurt School of Finance & Management
31	İlhan Günal	Erk Consultancy Training - Founding Partner
32	İrfan Donat	BloombergHT - Moderator
33	İzlem Erdem	Türkiye İş Bank Inc. Deputy Chief Executive
34	İzzet Kocadere	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
35	Kerem Akıner	Türkiye İş Bank Inc. Agricultural Banking Marketing Division Head
36	Kübra Koldemir	SustainFinance – Reporter
37	Mehmet Kaplan	Kaplan Agriculture - Agricultural Engineer
38	Mehmet Kurt	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
39	Metin Yüksel Bölüm	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
40	Mustafa Deniz	Bey Dere Seed Certification Test Directorate - Branch Manager
41	Mutlu Yenice	Türkiye İş Bank Inc. Saruhanlı/Manisa Branch Manager
42	Nazmi Durgut	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
43	Nevzat Ağrı	Agrova Seed – CEO
44	Oğuz Bardak	Finance In Motion - Investment Manager
45	Onur Takımcı	Takımcı Agricultural Products Marketing - Founding Partner
46	Özgen Özata	Türkiye İş Bank Inc. SME Banking Sales Department Unit Manager
47	Prof. Dr. İbrahim Demir	Ankara University - Academician
48	Prof. Dr.Hakan Özkan	Çukurova University - Academician
49	Prof. Dr.Hamit Köksel	Turkish Flour Industrialists Federation - Academician
50	Prof. Yalçın Kaya	Trakya University - Academician
51	Raşit Yılmaz	Hayrabolu Production and Marketing Cooperative/Leader Farmer
52	Satı Erol Taşır	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
53	Seçkin Metin	Metgen Seed - Owner
54	Sedat Çamcı	Çamcı Agri-Food - Company Manager
55	Selami Yazar	Chairman of Plant Breeding Sub-association
56	Simge Uyaniker	Uyaniker Agriculture Industry And Trade Limited Company
57	Tahsin Gündoğdu	Gündoğdu Seed Production Agriculture - Company Manager
58	Tuğba Özdemir	Pak Seed Production - Production Manager
59	Ümit Yılmaz	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
60	Yahya Kemal Kaya	Türkiye İş Bank Inc. Agricultural Banking Marketing Department
61	Yusuf Öztürk	Türkiye İş Bank Inc. Agricultural Banking Marketing Department

Programme



09.06.2023, Cuma

- 09:30 - 10:00 **Kayıt ve Açılış**
- 10:00 - 10:10 **Çalıştay Açılışı** - İrfan Donat Moderatör-BloombergHT
- 10:10 - 10:20 **Hoş Geldiniz Konuşması**
İzlem Erdem, Türkiye İş Bankası A.Ş. Genel Müdür Yardımcısı
- 10:20 - 10:25 **Finance In Motion**
Oğuz Bardak, Yatırım Yöneticisi
- 10:25 - 10:35 **Frankfurt School**
İbrahim Oğuz, Agronomist
- 10:35 - 12:00 **Çalıştay Oturumu** - "Tohum Islahı ve Teknoloji: Tohum Islahında Teknoloji Kullanımına Teşvik Etmek"
- 12:00 - 12:10 **Kahve Arası**
- 12:10 - 13:30 **Çalıştay Oturumu** - "Tohum Sürdürülebilirlik ve İklim Değişikliği: Değişen iklim koşulları karşısında üretilen tohumların sürdürülebilirliğini sağlayacak yöntemler"
- 13:30 - 14:30 **Öğle Yemeği**, Kat 40
- 14:30 - 14:45 **Masalarda Çıktıların Derlenmesi**
- 14:45 - 15:45 **İrfan Donat** - Oturumların Çıktıları
- 15:45 - 16:00 **Kapanış**

Etkinliğimizde, fotoğraf çekimi yapılmakta ve kamera kaydı alınmaktadır.



Closing



REPORT METHODOLOGY

- The groups have been selected under the main headings of Environmental, Social and Governance.
- The views of the participants have been kept faithful to impartiality.
- The topics emphasized in the workshop are listed in the "Problems" and "Solution Suggestions" sections.

ENVIRONMENTAL FACTORS



CLIMATE CHANGE

<u>PROBLEMS</u>	<u>PROPOSED SOLUTIONS</u>
<p>Climate Resilience</p> <ul style="list-style-type: none"> ▪ Inability to continue production with the same products in the face of changing climatic conditions. ▪ Increase in diseases caused by humidity as a result of climate change. ▪ Inadequate studies on the reduction/prevention of carbon emissions. 	<p>Climate Resilience</p> <ul style="list-style-type: none"> ▪ Priority plants should be identified within the scope of climate change studies. ▪ Carbon emissions should be balanced by selecting products that release the most oxygen to nature. ▪ Efforts to combat drought and water stress should be increased. ▪ In terms of carbon emissions, methods such as reduced tillage and direct sowing should be adopted. ▪ Energy needs in seed drying and processing stages should be met from renewable energy. ▪ Plant production in closed environments production should be increased. ▪ Seeds should be grown and used in accordance with the climatic conditions of the regions in a manner specific to that region. ▪ Breeding studies for developing heat and drought-tolerant plants should be accelerated.

Water Stress

- Failure to breed drought-resistant varieties

Diseases and Pest Organisms

- Use of pesticides that contaminate groundwater and are not suitable for cropping patterns.
- Supporting breeding of species and varieties resistant to diseases and harmful organisms.
- Challenges in production in crops where diseases are prevalent.

- The right breeding methods should be selected that favour the reduction of carbon emissions.
- Local material and local varieties should be screened for stress tolerance.

Water Stress

- Efforts should be increased to develop varieties that require less water and can achieve high yields with minimal water usage
- Proper fertigation (fertilization with irrigation) should be applied at the right time in lines tolerant to drought (plants coming from the same single plant).
- Water management methods such as moisture absorbers and polymers holding materials should be used.

Diseases and Pest Organisms

- Organic inputs should be used in seed development processes.
- Hybrid sunflowers for oilseed the use of seeds to prevent the spread of diseases that it's getting in the way, also hybrid in sunflowers for nuts seed utilisation should be mainstreamed.

SOCIAL FACTORS



SOCIOLOGICAL STRUCTURE

<u>PROBLEMS</u>	<u>PROPOSED SOLUTIONS</u>
<p>Collaborations</p> <ul style="list-style-type: none"> ▪ The insufficient awareness among agricultural civil society organizations about our country's agricultural policy and the inadequacy of planning in this regard ▪ The lack of widespread collaboration between universities, industry and the private sector ▪ Ineffective implementation of inter-institutional protocols. 	<p>Collaborations</p> <ul style="list-style-type: none"> ▪ The driving force of the public sector, the dynamism of the private sector and the technical knowledge of universities should be utilised to develop a culture of joint projects and work. ▪ Autonomous technology companies should be established where the public sector, universities, co-operatives and private sector seed production can work together. ▪ Seed producers, seed production technoparks active in the field, initiatives and universities which facilitates their co-operation arrangements should be made. ▪ The public sector and universities should make their laboratories available for common use. ▪ Facilities and capabilities for seed R&D activities should be developed in public sector and universities. ▪ Problems independent organisations identified and resolved by proposals should be put forward.

Sociological Structure

- Insufficient interest, contribution and follow-up to national and international journals and publications related to seed in Türkiye.
- The limited number of young, idealistic, tech-savvy farmers who closely follow technological advancements and actively utilize technology
- Perception of hybrid seed as GMO (genetically modified organism) seed.
- Inadequat societal perception that plant-based products can be utilized as a source of protein.

Sociological Structure

- The quality of seed-related journals should be improved, social media channels should be used more effectively and structures should be developed to increase social awareness on the subject.
- Media should be created to inform both producers and consumers about seed and seed production in a healthy way.
- Information on GMOs and other seed technologies should be shared with the public and the public should be enlightened on these issues.
- In order to popularise the use of hybrid seeds, efforts should be made to inform and educate the public.
- High inclusiveness in the sector publications should be known and this to utilise publications studies should be carried out.

USE OF DIGITAL TECHNOLOGIES

<u>PROBLEMS</u>	<u>PROPOSED SOLUTIONS</u>
<ul style="list-style-type: none"> ▪ Inadequacy of the digital catalogue containing the characterisation of the agricultural properties of the seeds in the genebanks. ▪ Inability to track seeds digitally. 	<ul style="list-style-type: none"> ▪ Digital applications should be integrated with breeding and production activities. ▪ Digital traceability of seed should be ensured and its evolution from past to present should be accurately defined. ▪ Within the scope of the "Digital Seed" project; artificial intelligence-based candidate lines should be selected, selected DNA markers should be matched correctly, all processes, including registration and reporting, should be created with a block chain and these links should be used to link the breeding lines. on the characteristics of seeds access to information by farmers must be provided.

LACK OF INFORMATION

<u>PROBLEMS</u>	<u>PROPOSED SOLUTIONS</u>
<ul style="list-style-type: none">▪ The lack of necessary education and knowledge among our farmers regarding seeds. Young professionals who have recently graduated from agricultural faculties do not have sufficient knowledge and experience on seed.▪ Farmers in Türkiye not being well-versed in correct production techniques.▪ Seed producers lacking the desired level of competence in areas such as establishing laboratories, conducting research, and performing GMO and disease tests.	<ul style="list-style-type: none">▪ Plans should be made to increase the level of knowledge of producers and seed producers.▪ Universities should be supported to closely follow domestic and foreign developments in seed technologies.▪ Opportunities for national and international experiences should be increased for university students to improve themselves in the field of technology.

GOVERNANCE FACTORS



LACK OF POLICY

PROBLEMS	PROPOSED SOLUTIONS
<ul style="list-style-type: none"> ▪ The conditions under which domestic and foreign companies work together in Türkiye are not sufficiently transparent, and information on competition conditions, including the continuity of R&D activities, is not easily accessible. ▪ Prolonged approval processes for certification due to the lack of specific institutions and parameters. ▪ Legal regulations do not cover all processes end-to-end, and regulations and implementation instructions are not announced simultaneously. 	<ul style="list-style-type: none"> ▪ Principles, registration and certification processes for the use of seed varieties not available in our country should be defined, including issues related to food safety. ▪ It should be ensured that international protocols on access to genetic resources and benefit sharing between related parties are signed and implementation recommendations are put into practice. ▪ Seed sector growth and crop yields also has a positive effect on the increase agricultural price stability in products must be provided. ▪ The use of TİGEM (Agricultural Businesses General Directorate) lands in the seed sector should be extended. ▪ In addition to research and education institutions on biodiversity, an institute dedicated to this subject should be established.

Planning

- Low awareness on the use of the right product (seed) in the right place (climate-soil).

- The use of certified seeds should be made widespread.
- The use of technoparks in the field of agriculture should be facilitated and technopark facilities such as tax exemption for the varieties developed by private companies engaged in seed breeding activities should be provided.
- The sustainability of the activities of seed companies should be ensured. and policies to reduce their economic sensitivity must be created.
- A supervised competition system should be established to emphasise good features, and legislative updates should be made to support the formation of a healthy competition market.
- Processes such as registration and certification should be implemented in a way to ensure healthy competition.
- Legislation and regulations covering patent and registration processes in the field of seed production should be established and updated in a way to protect the producers.

Planning

- Conscious and planned production process should be made operational through legislation and support.

- Inadequate guidance in production.
- Inadequate investment planning in seed breeding efforts.

Incentive

- The inability to receive support in contract seed production due to the basin-based system. Support being provided only through the specified public bank, leading to congestion. Subsidies for seed breeding are given for 2-3 years and research activities are limited to these periods.

- With contracted production, supply and demand should be made predictable and planning should be made accordingly.
- Strategic targets should be determined and positive discrimination should be applied in this direction to ensure the correct clustering and development of companies in the sector.
- Public co-operation for seed breeding studies (The Scientific and Technological Research Council of Turkey (TÜBİTAK), Republic of Türkiye Ministry of Agriculture and Forestry General Directorate of Agricultural Research and Policies (TAGEM) etc.) and investments for periods of 3+3+3+3 years should be common. should be planned.
- In the agricultural areas, it should be planned which seed will be produced under conditions today's modelling It must be done.

Incentive

- The basin-based system in contracted seed production should be abolished, crop-based-regional contract-based systems should be developed as in sugar beet production, and contracted seed should be made widespread.

	<ul style="list-style-type: none">▪ Premium payments should be based not only on product purchases but also on the use of certified seeds.▪ It should be ensured that subsidies are also provided by other financial institutions financing agriculture.▪ Banking legislation should be regulated in order to facilitate the provision of financing at the seed patent stage.▪ Support for seed breeding their duration should be extended.▪ Arrangements should be made to increase incentives in order to reduce costs in the seed sector.▪ Active producers should be controlled in the use of incentives, active producers should benefit from incentives instead of land owners and processes should be recorded.▪ Certification process should be simplified.▪ Continuity of R&D activities should be provided and incentives should be mainstreamed.
--	--

*Information, links and resources may not be used without written permission from İşbank.

STRUCTURAL / SYSTEMIC PROBLEMS

<u>PROBLEMS</u>	<u>PROPOSED SOLUTIONS</u>
<p>Reclamation</p> <ul style="list-style-type: none"> ▪ Insufficient knowledge of breeding methods. ▪ DNA transfer studies are not shared between research institutes and universities. ▪ Long duration of seed breeding studies. ▪ Failure to prioritise local seeds in breeding studies. 	<p>Reclamation</p> <ul style="list-style-type: none"> ▪ The private sector should carry out breeding activities to obtain durable seeds to ensure sustainability in agriculture instead of profit-oriented seed breeding. ▪ New trends and technologies should be followed and integrated into breeding processes. ▪ Local varieties in breeding studies and species should be prioritised; R&D supports domestic varieties in a way that encourages must be transformed. ▪ The focus should be on shortening the breeding periods and generation skipping. ▪ Agricultural engineers should be able to carry out multidisciplinary studies and make effective use of studies and developments in the fields of molecular genetics, plant molecular genetics and biotechnology. ▪ R&D investments should be made for studies carried out with the "Marker Assisted Selection" method based on DNA analysis. ▪

- A central authority should be established for productive crops for which DNA sequencing and irradiation-mutation studies have been carried out and should provide supervision and guidance to ensure the correct use of these techniques.
- Research institutions should be able to perform DNA and protein-based screening for the desired characteristics within the scope of biodiversity.
- Disease resistant genes should be identified in biodiversity studies and made available to breeders.
- New genetic materials compatible with the needs of water and soil should be developed by considering the seed variety.
- Studies should be carried out to shorten the duration of breeding studies, which takes 8-10 years on average, to 5 years or less, and incentives should be planned in this context.
- Wheat in breeding studies, sugar beet, rapeseed, winter vegetables, fodder crops, sunflowers etc. strategic plants as well as endemic plants and production value outwards in high plants with a high level of dependence prioritisation of varieties must go.

R&D

- Insufficient resources allocated to R&D activities in our country.
- For scientific R&D research universities have limited budgets to be.

Gene Banks

- The number and geographical distribution of gene banks do not meet the needs.

- Reclamation work will be carried out a regional and national programme for products perspective should be taken, food safety and bioethanol* energies should be focussed on.

*Bioethanol: It is a type of fuel produced from various cellulose-based agricultural products such as corn, sugar beet, molasses.

- Priority should be given to improved local varieties in certified seeds.
- In case of seasonal shifts, agronomy (cultivation technique) studies should be renewed in breeding studies.
- In addition to classical breeding, molecular breeding and mutation breeding methods should also be applied.

R&D

- For success in the international arena, at least 30 per cent of seed sector revenues should be used for R&D investments.
- In order to ensure food supply security contract manufacturing finance sector by more should be supported.

Gene Banks

- Efforts should be made to increase the viability rate in gene banks.

- Existing gene banks are insufficient in terms of infrastructure and human resources.
- Seed viability in gene banks is low.

Value Added Product Creation

- Failure to bring the added value created due to the re-purchase of our country's seeds after R&D activities carried out abroad.
- The small number of large-scale companies in the sector in terms of seed, fertiliser, pesticide and technical capacity.
- Branding activities in the sector inadequate.

- The number of gene centres in Türkiye should be increased and priority should be given to the employment of qualified personnel.
- The infrastructure of existing gene banks should be reviewed in line with technological needs.
- Gene banks should establish an in-situ conservation programme in order to use resources efficiently in the fields of collection, conservation, characterisation, cataloguing and making available.
- Regional gene banks should be established in places rich in gene varieties.

Value Added Product Creation

- Quality seed must be produced.
- Branding activities for seeds should be increased.
- The value of endemic species in our geography should be recognised and investments should be made for their processing.
- In order to produce regional products with added value, facilities to process products in rural areas should be established and supportive studies should be carried out.
- Certified seed labelling must be done correctly.

Labour Shortage

- Agricultural faculties in our country seed, although widespread trained and qualified employees working in the field of low number of personnel.
- Trained personnel, foreign transferred by companies to be done.

Production Cost

- The higher cost of domestic seeds compared to imported seeds, resulting in the inability to sell domestic seeds.

Labour Shortage

- Necessary training and arrangements should be made so that people with genetics or molecular biology education can also become "plant breeders".
- Master's and doctoral programmes in the field of seed production technologies and breeding should be expanded.
- Wage policies should be revised in order to employ qualified personnel.
- Thesis programmes should be established together with the private sector for master's and doctorate programmes; projects should be financially supported and studies should be carried out for the employment of graduates of the programmes.

Production Cost

- In order to develop domestic seed production, privileges should be offered to domestic seed companies.
- Price policies that will balance the market should be determined.
- In order to create food security, the sale of domestic companies to foreigners should be limited.

<p>Audit</p> <ul style="list-style-type: none">▪ Inadequate laws and sanctions to prevent misuse of seed and illegal seed use.▪ Inadequate physical controls of the Seed Registration and Certification Centre.	<p>Audit</p> <ul style="list-style-type: none">▪ Illegal production and illegal seed sales should be prevented.▪ Certified seeds should be used and unregistered seed use should be prevented.▪ Physical inspections/controls should be increased.
---	---

HIGHLIGHTS

Environmental Factors	Social Factors	Governance Factors
<ul style="list-style-type: none">• Climate Change	<ul style="list-style-type: none">• Sociological Structure• Digital Technologies Usage• Lack of Information	<ul style="list-style-type: none">• Lack of Policy• Structural / Systemic Problems

Within the scope of the workshop; the issues raised by the stakeholders are listed under the headings of "Environmental, Social and Governance", including financial and non-financial "Problems and Solution Suggestions".

The "Highlights" section encompasses the steps recommended in the short, medium, and long term to address the concerns outlined in this report.

In the short term;

- **R&D:** Research should be carried out on products compatible with changing climatic conditions sensitive to human health and food safety.
- **Data Management:** Data quality should be improved, data-based agricultural policies should be implemented, and a digital seed database that can be monitored with blockchain technology should be created.
- **Planning:** Production maps and plans should be prepared regionally to balance supply and demand.
- **Determination of Domestic and Imported Seed Prices:** The effectiveness of price policies should be increased, and market competition conditions should be determined fairly.
- **Elimination of Lack of Information:** Farmer trainings focused on productivity, sustainability, and profitability should be organized, and awareness should be raised through farmer meetings or technology-focused events.
- **Sustainability:** Awareness-raising activities should be carried out on greenhouse gas emissions, water use, and soil cultivation.
- **Inspection:** Sales and supply of smuggled/fake/counterfeit products should be prevented.

In the medium term

- **Organization (Producer, Industrialist, Consumer):** Cooperation mechanisms should be established between seed associations, universities, producers, consumers, industrialists and all relevant organizations.
- **Rural Life:** Development projects should be developed to increase welfare in rural life, and plant and animal production should be encouraged.
- **Supportive Public Policies:** Policies focussed on sustainability, international competition, and development should be developed.
- **A Healthy Functioning Value Chain** should be designed.
- **Incentive and Financing Models** should be developed.

In the long term;

- **Trust in Public Policies** should be increased.
- A **governance structure** should be established to merge **in Ethical Values**.
- Policies/regulations that will ensure **the improvement of competition conditions** should be implemented.
- **Long-Term and Sustainable Income Flow Model** should be established.
- **Organization in the International Market** should be strengthened.
- Emphasis should be placed on **Branding**.

İşbank will continue to support production processes that respect human beings, living creatures, and the earth and are compatible with nature. In addition to our conventional banking activities in line with the "Sustainable Development Goals and Indicators", we will continue to produce innovative solutions specific to the sector, where agriculture intersects much more with technology and finance.

It is essential and necessary for all stakeholders to act together and meet on common ground to find and implement precise and sustainable solutions, take bigger steps, and provide significant outputs to the agricultural sector.

As İşbank, we aim to increase our knowledge and insight in this field and thus our ability to be a solution partner, not only as a bank but also as a vital link in the agricultural value chain.

ABOUT SUSTAINFINANCE

The workshop's comprehensive report, produced through a collaborative effort involving Türkiye İş Bankası EFSE Development Facility and Frankfurt School of Finance & Management, has been compiled by the SustainFinance team members: Ayşe Kaşıkçı, İlkey Demirdağ, and Kübra Koldemir. The report reflects the insightful perspectives shared by various stakeholders during the workshop.

For further information, please refer to SustainFinance's website at sustainfinance.org, or get in touch via email at kubra@sustainfinance.org.

SustainFinance is a non-profit organization driven by the vision of embedding sustainability principles into the decision-making processes of the investment industry. It provides a platform where multiple stakeholders can engage, articulate diverse viewpoints, and exchange ideas.

It's important to note that throughout the report, information has been systematically categorized under the overarching themes of "Environmental, Social, and Governance". The compilation remains impartial, upholding the perspectives expressed by participants in a neutral manner.



TODAY'S
Seed

FUTURE'S
Agriculture

IMECE WORKSHOPS

SEED

June 2023

Istanbul

TÜRKİYE  BANKASI

