

IPDEV Work Package 6:

**ASSESSING THE ECONOMIC
IMPLICATIONS OF DIFFERENT MODELS
FOR IMPLEMENTING THE REQUIREMENT
TO PROTECT PLANT VARIETIES**

CASE STUDY ON TURKEY

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As the project proposal states, “The objective of this Work package is to assess the effectiveness of the regulatory measures employed by EU candidate countries and developing countries to implement Article 27.3(b) of the TRIPs Agreement as it relates to the protection of plant varieties. The analysis treats plant variety protection as not being an end in itself but a part of a larger policy framework related to economic growth in the agricultural sector. In addition, ‘effectiveness’ is considered from multiple perspectives and not only as a requirement for compliance with international agreements.” In addition to this focus, the work package also maps out two broad tasks: beginning with collating and reviewing the relevant literature and followed by country case studies. The country case studies (a mix of primary research and research based on secondary literature) will be conducted in terms of the ‘funding’ that are presented in the ‘literature review’.

1. INTRODUCTION to Turkey



1.1. Turkish geography

Turkey is located in the Southeastern Europe and Southwestern Asia. It has very strategic location controlling the Turkish Straits (Bosporus, Sea of Marmara, Dardanelles) that link Black and Aegean Seas. Mount Ararat, the legendary landing place of Noah's Ark, is in the far eastern portion of the country. Turkey's land mass is 814,578¹ sq km. The European and Asian sides are divided by the Istanbul Bogazi (Bosporus), the Sea of Marmara, and the

¹ <http://www.turkishtravel.com/useful01.htm>
http://www.fao.org/AG/agL/swlwpnr/reports/y_nr/z_tr/tr.htm#waterr

Canakkale Bogazi (Dardanelles). The coastline of Turkey's four seas is more than 8,333 km long. The lowest point: Mediterranean Sea 0 m and the highest point: Mount Ararat 5,166 m. In the north, the eastern Black Sea Mountain chain runs parallel to the Black Sea; in the south, the Taurus Mountains sweep down almost to the narrow, fertile coastal plain along the coast. Anatolia is a high plateau region rising progressively towards the east, broken up by the valleys of about 15 rivers, including the Dicle (Tigris) and the Firat (Euphrates).

There are numerous lakes and some, such as Lake Van, are as large as inland seas. Turkey has 14,300 km² water surface. Rainfall accounts for an average of 501 billion m³ of water annually. It is estimated that 274 billion m³ of this returns to the atmosphere through evaporation and transpiration from soil and water surfaces and plants; 41 billion m³ feeds underground reservoirs through leakage and deep percolation; and 186 billion m³ runs off into seas or lakes. Around 6.9 billion m³ of water is added to the country's water potential through rivers of neighboring countries. Thus the renewable fresh (surface) water potential of Turkey is about 234 billion m³, depending on climatic fluctuations. The total safe yield of ground water resources is estimated at 12 billion m³. Finally, it is estimated that the total (technically and economically) usable surface and ground water potential of Turkey is 110 billion m³, with 95 billion m³ of this coming from internal rivers. 3 billion m³ from external rivers and 12 billion m³ from ground water resources. Turkey possesses 177,714 km of river, 203,599 hectares of lakes natural of lakes and 179,920 hectares of lakes created by dams and artificial lakes, an area which is increasing all the time. To review matters related to water resources, Turkey has been divided into 26 water collection regions. The country's great geographical and climatic variety means that its water supplies are often not to be found in the right place and at the right time to meet demand. The Average annual precipitation is 643 mm, but this figure conceals wide variation from region to region.

Turkey enjoys a variety of climates, ranging from the temperate climate of the Black Sea region, to the continental climate of the interior, then, to the Mediterranean climate of the Aegean and Mediterranean coastal regions. Summers are very hot and dry and winters are mild and wet, harsher in the interior.

According to the July 2005 census, Turkey has 69,660,559² inhabitants, 41% of whom live in the countryside. The major cities are: Istanbul (7.4 mil); Ankara, the capital (3.2 mil); Izmir

² <http://www.answers.com/topic/turkey-1>

(2.7 mil); Adana (1.9 mil); Antalya (1.1 mil); and Bursa (1.6 mil). The age structure of the population is 26% (0-14 years); 67.3% (15-64 years) and 6.7% (65 years and over). Ethnically, Turks predominate; Kurdish, Arabic, Greek, Circassian, Georgian, Armenian, and Jewish communities of varying sizes complete the ethnic mosaic of the rich and complex culture of the Turkish society³. The official language is Turkish and spoken by the 90% of the population. There are also many languages and dialects spoken, such as Caucasian and Kurdish dialects, Arabic, Armenian and Greek⁴. The Turkish language belongs to the Ural-Altaic group and has an affinity with the Finno-Hungarian languages. Turkish is written with the Latin alphabet and is spoken by some 200 million people around the world. The literate population is average 86.5% (male: 94.3%; female: 78.7%). Although Turkey is 99% Moslem, it is a secular state that guarantees complete freedom of worship to non-Moslems. The Turkish Republic is based on a secular, democratic, pluralistic and parliamentary system where human rights are protected by law and social justice. The National Assembly is elected by popular vote and the nation is governed by the Council of Ministers headed by the Prime Minister.

Turkey is a founding member of OECD, the Black Sea Economic Cooperation Organization, a member of NATO, the European Council and the European Parliament, and an associate member of the European Union. In recent years, Turkey has become a major tourist destination in Europe. It is very attractive with its nature and the rich culture. It has been called "the cradle of civilization". However, the agriculture also plays a very important role in the Turkish economy.

1.2. Place of the agrarian sector in the national economy

Turkey's dynamic economy is a complex mix of modern industry and commerce along with a traditional agriculture sector that in 2004 still accounted for more than 35% of employment. It has a strong and rapidly growing private sector, yet the state still plays a major role in basic industry, banking, transport, and communication. The largest industrial sector is textiles and clothing, which accounts for one-third of industrial employment; it faces stiff competition in international markets with the end of the global quota system. However, other sectors, notably the automotive and electronics industries, are rising in importance within Turkey's export mix.

³ Turkey Demographic and Health Survey 2003, Hacettepe University Institute of Population Studies, Ankara, Turkey, October 2004, <http://www.measuredhs.com>.

⁴ <http://www.thaem.gov.tr>.

In recent years the economic situation has been marked by erratic economic growth and serious imbalances. In recent years, the Turkish economy has expanded particularly strongly, registering growth rates of 8.9% and 7.4% for the 2004 and 2005 fiscal years respectively. The composition of the GDP by sectors up to 2003 is: agriculture: 11.7%; industry: 29.8%; services: 58.5%. The co-existence of agriculture and industry has some disadvantages. The developing industries and urbanization causes heavy metal pollution in air, soil and waters. The water pollution also is result of dumping of chemicals and detergents. The oil spills from increasing Bosphorus ship traffic causes deforestation. The amount of heavy metal in soil and water has the potential to increase by means of industrial activity, main road and airways, use of pesticides intensively and irrigation by polluted water. Turkey has not confronted with the problem soil and water contamination problem yet seriously on large scale. But the problem started to emerge on very heavily industrialized areas and some measures should be taken. Turkey is party to the following international agreements: Air Pollution, Antarctic Treaty, Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Ozone Layer Protection, Ship Pollution, and Wetlands.

1.3. Land use.

Obviously the agriculture has very important place in the Turkey” economy. The irrigated land is about 42,000 sq km (1998 est.). The arable land is about 30.93%, the permanent crops are about 3.31% and others: 65.76% (2002 est.)⁵. The main crops in the Turkish agriculture are wheat, rice, cotton, tea, tobacco, hazelnuts, and fruits. Sheep are Turkey's most important livestock, and Turkey is one of the major cotton and wool producers. Industry is developing rapidly, and is directed mainly towards the processing agricultural products, metallurgy, textiles, and the manufacture of automobiles and agricultural machinery. Southeast Anatolia Project (GAP) is a multi-purpose, integrated development project comprising dams, hydroelectric power plants and irrigation facilities that are being built on the Firat (Euphrates) and Dicle (Tigris) rivers. It will affect agriculture, transportation, education, tourism, health and other sectors.

Despite of the pollution, the soils with high production capacity cover 6.5%⁶ (5 million ha) of the total land area (77.9 million ha) in Turkey. The proportion is equal 1/5 of the potential agricultural soils of country. The highly and moderately productive soils of Turkey comprise

⁵ http://www.fao.org/AG/agL/swlwpnr/reports/y_nr/z_tr/tr.htm#socio

⁶ http://www.fao.org/AG/agL/swlwpnr/reports/y_nr/z_tr/tr.htm#landr

an area of 19.1 million ha. This is almost equal to one quarter (24%) of the country's land. However, there are 7.4 million ha land which are marginally productive, but currently used for crop production, pasture land forest and settlement areas cover about 4.8 million ha. About 573.239 ha of land is occupied by various industries and urban settlements, most of which are of prime quality.

The main problem widely faced in Turkey in terms of land management is that land area is not expediently used with their capabilities⁷. While 66% of the total land resources is properly employed, 33% is under appropriate or non-agricultural uses. Road construction, urban development, new residential areas, industry, mine activities have recently imposed great constraints on agricultural lands and their production potentia.

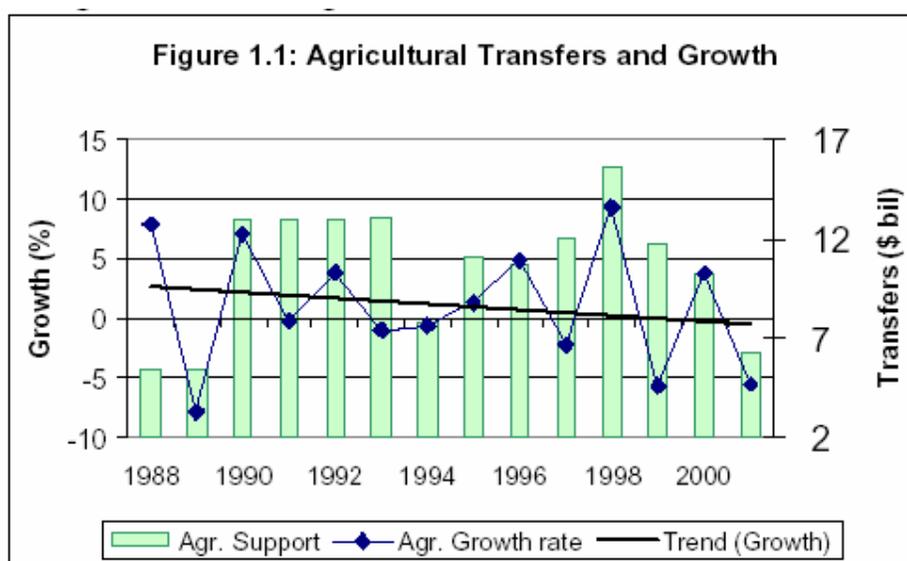
Another problem is the fertility of the soils. The balanced and sufficient amounts of fertilizer application are very important for the stability of productivity and it is improvement. In order to manage fertilizer applications properly, soils must be analyzed. For determine the fertility status of Turkish agricultural soils, 243 453 soil samples are collected from all over Turkey and analyzed for texture, pH, organic matter, lime, available potassium, available phosphorous. The results are grouped for nine different agricultural zones. According to the soil survey and research trials zinc and iron deficiency seems to create a major problem in Turkish soils. Potentially 48% of the soils is deficient in iron content and 50% of the soils is deficient in zinc content. This necessitates using fertilizer in the agriculture for better production. While total fertilizer production has been 3.3 million ton, fertilizer consumption has been about 5,5 million-ton in 1999. The total fertilizer production has been not adequate for the total fertilizer consumption or demand. Thus fertilizer are imported from abroad. In fact the total fertilizer production capacity is enough to satisfy the whole demand. But under open market conditions and globalization, companies prefer to import fertilizer because of its cheaper price. Companies prefer importing because importing also reduce the problems of storage. In the same time, the variability of the physical and chemical properties of the soils is very high. This causes a problem in uniform application of agricultural practices. There are many wide spread major soil groups because of great variety of geological structure, climate and vegetation in Turkey. In fact there are a lot of factors, which restrict using new agricultural techniques related to soil fertility management; too much sloppy areas and

⁷ http://www.fao.org/AG/agL/swlwpnr/reports/y_nr/z_tr/tr.htm#plant

obligatory cultivation on steep slopes, shallow soils, low biologic activity, high sensitivity to erosion, stoniness, salinity and drought risks.

Soil erosion is a crucial problem from the point of views of soil fertility and sustainability. Because of water and wind erosion, the majority of arable lands are subjected to the degradation of soil structure and soil loss. 68% of the arable land seriously suffer from soil erosion. Whilst conventional technique of terracing, strip cropping and appropriate cultivation techniques have been shown to reduce soil loss and increase yield of arable crops, but transfer of knowledge and application by farmers has been slight.

Despite of the above mentioned problems, Turkey is endowed with rich natural and human resources, but its full potential for rural growth went largely unrealized in the period between 1980 and 2002 because of increasingly inefficient rural development policies focused on two main objectives. The first was self-sufficiency in key individual products to be brought about by increasing yields and production levels through the subsidization of agricultural inputs and credit and through the expansion of cultivated land with heavy public investment on irrigation. The second was increasing agricultural incomes by emphasizing output price support policies and protective trade measures. During the last four decades agricultural GDP grew about three times slower than the overall economy, resulting in a declining share of agriculture in GDP from 35 percent in 1960 to 15 percent in 2000 (Figure 1.1, using SIS and OECD data)⁸.



⁸ <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

However, the share of agricultural labor in total labor force declined by much less, from 55 percent in 1960 to 44 percent in 1997. Although labor productivity in agriculture showed an upward trend over the period 1960-2000, growth rates declined steadily and turned negative in the mid-1990s, with the growth of land productivity showing a similar trend. Agricultural subsidies generated significant and unsustainable fiscal costs, and high import tariff policies placed a heavy burden on low and middle income consumers. As input and price subsidies disproportionately benefited large farmers, this type of agricultural support contributed to income inequality and widening of absolute income differentials in rural areas.

1.4. Development of the agricultural sector.

1.4.1. Direct Income Support (DIS) Program⁹.

In the latter half of the 1990s, budget deficits and debt levels in Turkey were allowed to reach such high levels that the country's macroeconomic stability was severely undermined. High inflation and volatility of the real exchange rate caused growth rates to oscillate excessively in a "boom and bust" cycle. In order to address this instability, the Government of Turkey (GOT) embarked on a path of disinflation in early 2000, requiring a reduction of government expenditures in all sectors. Given the bloated level of annual budgetary and other fiscal support which agriculture had come to absorb by this time, reforms of agricultural subsidies had a significant role to play in this fiscal stabilization program. For this reason, the GOT initiated a politically demanding but thorough realignment of agricultural support policies, aimed at improving the efficiency in their support to the sector at greatly reduced levels.

Three years into the program, the agricultural subsidy reforms have contributed significantly to the fiscal stabilization agenda by reducing fiscal transfers to farmers by US \$4.3 billion, and avoiding a more prolonged and deeper recession. The agricultural subsidy reform program also succeeded in reducing significantly the redistribution of income from Turkish consumers to farmers by US \$3.6 billion (or from 22 percent to 8 percent of the value of agricultural consumption) to the benefit of the former. Direct payments to farmers are compensating almost half of the income loss imposed on Turkish farmers by the cuts in agricultural subsidies, proving to be an effective policy substitute for transferring income directly to them. The observed loss in agricultural income (16 percent between 1999 and 2002) primarily reflects the re-alignment in agricultural commodity and input prices that

⁹ <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

Turkey could no longer sustain fiscally; only 20 percent of the observed fall in agricultural income results from the 4 percent decline in agricultural output.

In 1999, fiscal subsidies to the agriculture sector had reached over 3.0 percent of GDP (US \$6.1 billion), although the sector contributed only 14 percent of GDP. The reforms of agricultural subsidies focused mainly on reducing the fiscal support to state and quasi-state marketing enterprises and to credit subsidies and debt write-offs in the rural finance system. Inefficiency in past government support was particularly evident in expenditures covering the annual losses of parastatal marketing and processing enterprises, of quasi-state Agricultural Sales Cooperative Unions (ASCUs), of the Agricultural Bank (Ziraat Bank), and the system of Agricultural Credit Cooperatives (ACCs). In tandem with the reduced intervention capacity of parastatal marketing enterprises, the subsidy reduction program also eliminated fertilizer subsidies and significantly reduced deficiency payments (output price supports) for most of the supported agricultural products. In partial compensation for these subsidy reductions the Government introduced a Direct Income Support (DIS) Program. Starting in 2001, the DIS Program has made annual payments of roughly US \$90/hectare to all farmers on the basis of their cultivated area.

1.4.2. Fiscal stabilization¹⁰

The agricultural subsidy reform program contributed significantly to fiscal stabilization. By 2002, the cuts in agricultural subsidies (US \$5.5 billion) coupled with the introduction of DIS reduced the cost of agricultural transfers (subsidies and DIS) by over 2.3 percent of GDP, contributing a third to the success in reaching the GOT target of a 6.5 percent primary budget surplus. By international standards, the magnitude of this fiscal adjustment from agriculture (agricultural transfers were cut by over two-thirds, or US \$4.3 billion) and its quality (since the adjustment squarely focused on subsidies rather than investments) are impressive.

By the end of 2002, the reform program reduced the fiscal outlays on agricultural subsidies by about US \$5.5 billion to US \$0.6 billion. This represents a savings of over 2.7 percent of GDP. Over half of the subsidy cuts is accounted by the US \$3.1 billion reduction in the coverage of losses for state financed crop purchases. The elimination of the credit subsidies and debt write-offs generated another US \$1.4 billion in fiscal savings. Fiscal transfers to

¹⁰ <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

ASCUs, which had reached US \$1 billion per year, were also reduced by US \$800 million. The other area of subsidy reduction was fertilizer subsidies, which declined by US \$300 million. Put together, 70 percent of the subsidy cuts were directed at lowering agricultural commodity prices and was primarily achieved by imposing hard budget constraints on state marketing and processing enterprises as well as the quasi-state ASCUs. The remaining 30 percent cut was aimed at reducing agricultural input subsidies, notably credit and fertilizer.

In 2001, the DIS Program was introduced by the GOT, aiming to compensate partially farmers for the negative impact on their income of subsidy reduction. As participation in the DIS Program reached about 75 percent of farmers in 2002, the cost of the DIS Program reached US \$1.25 billion. Thus, the net reduction in the annual fiscal cost of switching from heavy reliance on intervention in the output, input, and credit markets to the DIS Program has been on the order of US \$4.3 billion.

Looking forward, the level of fiscal savings from agriculture will likely fall for a number of reasons. First, the accumulation of budget liabilities for the losses of parastatals has not been entirely stemmed. Progress in reducing the intervention purchases of the Turkish (State) Grain Board (TMO) has been significant, and the cost of intervention purchases by the hazelnut ASCU (Fiskobirlik) has fallen, but less progress has been made in the sugar, tea, and tobacco markets. Moreover, there will be costs to the budget when the Turkish (State) Alcohol and Tobacco Company (TEKEL) is privatized and when the debts of Fiskobirlik to private banks eventually need to be covered. Finally, the DIS Program will likely reach a steady annual cost of almost US \$2 billion, when the DIS payment is increased by the expected inflation rate and the participation rate rises close to 90 percent in 2004 as expected, and if the TL/\$US exchange rate maintains its current level.

1.4.3. Turkish consumers' benefit¹¹.

Agricultural subsidy reforms benefit Turkish consumers. The agricultural subsidy reform program reduced the burden imposed on Turkish consumers by an estimated US\$3.6 billion (per capita – roughly US \$50) between 1999 and 2001. Prior to the reforms, agricultural subsidies imposed a heavy burden on consumers by keeping agricultural prices about 25-30 percent above international levels. According to the OECD, transfers from consumers to

¹¹ <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

farmers reached as much as US \$ 5.2 billion in 1999, the equivalent of 22 percent of agricultural consumption. Turkish consumers financed 55 percent of the overall support provided to farmers, in the form of higher food prices; about 45 percent of the remaining support to agriculture came from the budget. By 2001, following the reforms, transfers from consumers to farmers had fallen to only US \$1.6 billion annually (equivalent to 8 percent of consumers food budget), indicating a much lower level of support to farmers paid by consumers as agricultural prices fell closer to international levels. By 2001, consumers contributed less than 30 percent of a much lower level of support to farmers, with the remaining 70 percent financed by taxpayers. Consumers have therefore been a significant beneficiary of the reform of agricultural subsidies, and the poor have undoubtedly benefited even more given the larger share of their income spent on food compared to wealthier consumers. The large benefits for consumers is consistent with the earlier observation that 70 percent of the agricultural subsidy reforms was aimed at lowering the support of agricultural commodity prices.

1.4.4. Turkish farmers' compensation¹².

DIS payments compensate almost half of the income loss imposed on Turkish farmers by the cuts in agricultural subsidies. Between 1999 and 2002, agricultural income fell by 16 percent (US \$2.7 billion), while agricultural output declined by only 4 percent. The cuts in agricultural subsidies lowered agricultural commodity prices and raised input prices, bringing both closer to world price levels. By doing so, the cuts in agricultural subsidies realigned downward the profitability of agriculture that had been pushed artificially high by fiscally unsustainable subsidies. An estimated 80 percent of the 16 percent decline in agricultural income is explained by this realignment in agricultural profitability. The remaining 20 percent of the observed fall in agricultural income comes from lower agricultural output as farmers reacted to lower profitability, as well as to lower demand associated with the macroeconomic crisis of 2000 and 2001. DIS payments, however, reached US \$1.25 billion in 2002, and successfully compensated farmers by close to half of their income loss associated with the 16 percent decline in agricultural income. In aggregate terms, Turkish farmers suffered an estimated net income loss of US\$ 1.45 billion between 1999 and 2002. The large difference between the fiscal savings from the agricultural transfer (subsidy and DIS) reform program (US \$ 4.3 billion) and the net income loss to farmers (US \$1.45 billion) is a testimony to the

¹² <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

gross inefficiencies of the pre-reform agricultural subsidies in supporting farmers' income. This indicates that, from a fiscal or taxpayers' perspective, the current DIS program is a much more cost effective and fiscally sustainable way at supporting farmers' income than the earlier regime of output and input subsidies. Adding to these fiscal efficiency gains in supporting farmers, the significant savings for Turkish consumers described above would suggest that DIS is an efficient and more equitable substitute for blunt agricultural policies.

1.4.5. Prices and profitability¹³.

Agricultural prices and profitability adjust to agricultural subsidy reforms. In the latter half of the 1990s, output and input subsidies encouraged agriculture by artificially raising agricultural prices in real terms, and relative to either agricultural inputs or non-agricultural goods. This trend was reversed in 2000, and the reforms of agricultural input and output subsidies caused a significant re-alignment of agricultural prices. This re-alignment was, however, inevitable since the agricultural subsidies were not fiscally sustainable and had to be cut to help stabilize the economy. Between 1999 and 2002, agricultural prices in real terms declined by 13 percent and by 22 percent when measured relative to non-agricultural prices. Within agriculture, crop prices fell by 23 percent relative to input prices, and by 33 percent in the livestock sector. Not all the decline in agricultural prices results from lower agricultural subsidies. Lower demand for livestock products, brought about by the recession-led decline in per-capita incomes, have caused livestock prices to fall more than crop prices. Prices of the highly regulated crops, tobacco, sugar beet and hazelnut fell the most, between 25 and 50 percent in real terms as the level of government support was significantly reduced between 1999 and 2002. Grain (wheat, maize and barley) prices also declined by about 5 to 10 percent because of reduced interventions by the GOT. Prices of cotton and sunflower seed prices declined the least, either because government interventions were initially limited (cotton) or largely continued unreformed (sunflower). Fertilizer prices doubled when the 50 percent fertilizer price subsidy was reduced and finally phased out in November 2001. The price of agricultural credit witnessed a dramatic shift, as real interest rates increased from about -20 percent during the 90s to about +30 percent in 2001- 2002.

The level of indirect support to Turkish agricultural producers financed by agricultural subsidies and tariffs measures, and measured by the percentage Producer Subsidy Equivalent

¹³ <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

(PSE), averaged about 25 percent of farm receipts in 1998-1999. By 2001, this measure had declined to 10 percent, with Market Price Support having declined by roughly US \$2.3 billion. At this level, Turkey's PSE is one of the lowest of all OECD countries. In terms of individual commodities, crops and in particular grains, sugar and tobacco, account for the bulk of the decline in support to farmers. Since the crop component of the PSE has decreased much more rapidly than that of livestock, the share of support to animal production has increased from 30 to 40 percent. With continued general (i.e., non commodity-specific, such as duty losses and debt write-offs) fiscal support to agriculture still occurring in 2001, Turkey's Total Support Estimate (TSE) remains high (3.8 percent of GDP), although much lower than the peak of 6.7 percent of GDP achieved in 1998.

Agricultural production adjusts to changing prices, and shows early signs of a shift away from previously highly supported crops . Over the subsidy reform period, both fertilizer and agro-chemical usage have fallen back by 25 to 30 percent, to levels last seen in the early to mid-1990s. This is due to both the fall in agricultural income, as well as the higher fertilizer prices as the 50 percent subsidy was phased-out. Since flows of credit resources from the Treasury have been discontinued, the two main agricultural sector lenders, Ziraat Bank and the Agricultural Credit Cooperatives (ACCs), have reduced their loan portfolios by about three-fold from the peak level of US\$7.3 billion in 1997. Despite the lower usage of agricultural inputs and reduced availability of agricultural credit, the volume of crop and livestock output declined by only 4 percent from 1999 to 2001. Crop output was down only 2 percent, but livestock output fell 10 percent. As indicated earlier, it is believed that lower incomes and therefore lower demand for livestock products explain, in part, the larger drop in livestock production, notably sheep meat and eggs where most of the drop was observed. Overall cultivated area decreased by about 450,000 hectares (1.7 percent). The shift across general crop types has been small, as area sown to field crops declined by 2 percent, and the areas under fruit and vegetables increased by only 1 percent. The production volume of cereals, pulses, nuts, and fodder crops increased (in ascending order) by 2 to 16 percent, while production of fruits and vegetables has been stable. Tubers (mainly potatoes), industrial crops (mainly tobacco, sugar beet), and oilseeds have seen their volumes fall by 15 to 30 percent. These shifts are often more a result of regional weather variations than of relative prices, but generally they evidence a shift out of crops where support and prices have fallen the most (tobacco and sugar beet production fell by 40 and 24 percent, respectively) and an expansion of largely deregulated crops (e.g. cotton by 25 percent).

Reforms of the agricultural subsidies explain most of the fall in agricultural income. Movement in the Nominal Assistance Coefficient (NAC) summarizes the impact on farm income of reduced subsidization of both outputs and inputs. (The NAC is simply the ratio of total farm revenue including all direct subsidies reflected in the PSE relative to the underlying value of farm output at border prices without other output and input-based subsidies.) From 1999-2001, as market intervention levels and support prices for grains, hazelnuts, tobacco, sugarbeet, and tea declined, and other payments based on output and input use were also reduced significantly, the NAC declined by 16 percent, explaining two-thirds of the fall in agricultural income observed between 1999 and 2001. Preliminary data indicate that transfers to agriculture rose by almost 5 percent as the DIS program accelerated in 2002. Thus, over the whole period 1999-2002, subsidy reform was responsible for about 80 percent of the total (16 percent) fall in agricultural income. Crops, in particular grains and sugar, account for the bulk of the decline in support for farmers. Table 2.5¹⁴ above demonstrates the size of the relative declines in support for different types of agricultural production by tracing the evolution of the PSE by commodity. Overall, the reduction in support is in line with the reduced market intervention during the 2000-2001 period and lower levels of deficiency payments. Before the introduction of agricultural reforms, almost 70 percent of the aggregate PSE was accounted for by the crop component, while the livestock sector garnered about one-third. Since 1999, the support to the crop component decreased by over 3.1 quadrillion TL (US \$2.5 billion), with the grains sector absorbing about two thirds of this reduction. The sugar sector absorbed about 20 percent of the reduction. Support to the livestock sector dropped by about 1.7 quadrillion TL; proportionally less than in the crops sector. Hence, the relative importance of support to animal production has increased, to over 40 percent of the aggregate PSE.

¹⁴ <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

Table 2.5: Turkey - Main PSE Indicators by Commodity (Billion Real 2001 TL)

		1998	1999	2000	2001
Wheat	PSE (TL. bn)	1,575,871	1,254,393	588	-157,257
	Percentage PSE	42	42	21	-6
	NAC	1.72	1.72	1.27	0.94
Maize	PSE (TL. bn)	183,722	141,555	101,055	20,068
	Percentage PSE	45	39	32	7
	NAC	1.82	1.64	1.47	1.08
Other Grains	PSE (TL. bn)	702,282	515,792	260,128	44,218
	Percentage PSE	55	48	27	5
	NAC	2.22	1.92	1.37	1.05
Oilseeds	PSE (TL. bn)	134,300	156,795	114,545	71,992
	Percentage PSE	35	41	42	27
	NAC	1.54	1.69	1.72	1.37
Sugar	PSE (TL. bn)	1,078,794	860,893	564,918	184,181
	Percentage PSE	65	70	56	30
	NAC	2.86	3.33	2.27	1.43
Other Crops	PSE (TL. bn)	3,113,186	1,809,413	2,704,841	1,479,235
	Percentage PSE	13	9	13	8
	NAC	1.15	1.10	1.15	1.09

Total Crops	PSE (TL. bn)	6,788,154	4,738,841	4,333,278	1,642,437
	Percentage PSE	22	18	17	7
	NAC	1.28	1.22	1.20	1.08
Livestock	PSE (TL. bn)	2,679,365	2,828,209	2,226,693	1,122,553
	Percentage PSE	42	42	44	25
	NAC	1.72	1.72	1.79	1.33
Total	PSE (TL. bn)	9,467,519	7,567,050	6,559,971	2,764,990
	Percentage PSE	25	23	21	10
	NAC	1.33	1.30	1.27	1.11

Source: OECD and own calculations.

When one examines the gross crop value per hectare, similar trends are evident. By examining the magnitudes of the declines one can see that the DIS payment of 100 million TL per hectare was able to, on average, more than fully replace lost production value for field crops and for all crops taken together. However, within this wide category, this has likely not been the case for farmers more specialized in tobacco and sugar beet. Thus, the reforms appear to be moving production away from crops which were previously highly supported, but the DIS Program has not fully compensated those that formerly produced the most supported crops (nor was it designed to do so). Moreover, the overall reduction in value added in the sector has made it difficult for farms to find the resources needed to shift into relatively

more attractive crops. Supply response in 2001 was particularly sluggish owing to the poor macro-economic environment and very high real interest rates.

The fall in agricultural income largely reflects the re-alignment of agricultural prices and profitability. Agricultural income fell by 16% (US \$ 2.7 billion) between 1999 and 2002, and the subsidy reform was responsible for about 80 percent of that fall. The adverse movements in agricultural prices -- the 13 percent decline in real agricultural prices, combined with 13 percent increase in the real cost of agricultural inputs -- triggered by the phase-out of agricultural subsidies is the main factor behind the observed 16 percent decline in the agricultural value added. To a large extent, the fall in agricultural income reflects a downward adjustment in the profitability of agriculture profitability that had been pushed to artificially high levels by fiscally non-sustainable agricultural subsidies. The remaining 20 percent of the observed fall in agricultural value added comes from the (4 percent) decline in agricultural output, as farmers adjusted their production to lower profitability as well as to lower demand. DIS compensates farmers for close to 50 percent of their loss in agricultural income.

1.4.6. Agricultural and Rural development¹⁵.

There are important regional differences in the net impact of the agricultural subsidy reform program. In examining regional impacts, the total cultivated area has declined across the board, except in the Mediterranean region where it remained stable. These declines have ranged from 3.5 percent in the Central Anatolia region to 0.3 percent in the Aegean region. Indeed, two-thirds of this reduction occurred in the Central Anatolia region, where the sown areas (mainly grains) and fallow areas have decreased by over 300,000 hectares. xix. The combined effect of area reduction and the fall in agricultural subsidization has been the most notable in the Central Anatolia region, where the PSE (in real 2001 TL) was both highest in absolute terms in 1999 and fell the most in both absolute and relative terms. The lower levels of support to wheat and sugar beet largely explain this large decline in agricultural support to Central Anatolia. The agriculturally most developed regions, Mediterranean, Aegean, and Marmara, experienced absolute declines in agricultural support levels (only 40-60 percent as large as that of Central Anatolia) that are largely explained by the lower support levels for wheat and livestock products. The agricultural weakest regions, Eastern and Southeast

¹⁵ <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

Anatolia, experienced small absolute declines in agricultural support, although large in relative terms because of their very low initial level of agricultural support.

DIS payments fully compensated the income loss caused by subsidy cuts in Central Anatolia, even though that region experienced the greatest reduction in proportional terms. In contrast, the more commercially-oriented regions of Marmara and Aegean suffered the largest absolute declines in agricultural income, though relative to their pre-reform levels, the declines were proportionally less than in Central Anatolia. Thus, in these regions, DIS compensated less of the income loss since it is a fixed per hectare payment. Similarly income loss in Eastern and Southeastern Anatolia (with crop values per hectare below the national average) was fully compensated by DIS, while the Black Sea (with crop values per hectare above the national average) saw only partial replacement of the income loss by DIS.

Turkey's PSE has been regionally disaggregated in order to provide insights into how the reform of MPS has been shared among regions and crop sectors in each region. The support calculated for commodities by the OECD (Table 2.5) has been distributed to Turkey's 81 provinces in proportion to the provincial share in each of the commodities' production values at the national level. These PSE values for each province by commodity have then been aggregated at the regional level. One assumption made in this methodology is that the PSE for the category for "other commodities" includes only crops for which PSEs have not been separately reported by the OECD. The aggregated regional PSEs are presented below in Table 2.6. As in Tables 2.5, the values shown have been computed using the current year values for 1999 reflatd to 2001 real TL. Each crop and livestock product's direct contribution to the regional PSE may be seen from the disaggregation in each column of Table 2.6. Similarly, each region's contribution to the overall PSE may be seen from the row totals. The lower part of the table shows the aggregate changes from 1999 to 2001, along with percentage reductions from the 1999 base year levels. The totals have been calculated for both crop and livestock components separately and then aggregated (in the final row of the table). Reduced Grain and Sugar Support Cause Largest PSE Decline in Central Anatolia. In the crops sector, Central Anatolia has absorbed more than a third of the 3.1 quadrillion TL decline in the PSE, with losses there being about 60 percent in the grains sector and 40 percent from sugarbeet. The Marmara, Black Sea, and Mediterranean regions have all seen losses on the order 14 of 400 trillion TL. Losses in the grain sector have been dominant in all three regions, but the Black Sea region has also suffered substantially reduced flows of producer support in the sugarbeet

and “other crops” category (e.g., hazelnut). The East Anatolia and Southeastern Anatolia regions have suffered losses mainly in the grains sector, each of these represent only about 10 percent of the fall in the grain sectors’ PSEs nation-wide. Being the most diverse region agriculturally, it is not surprising that the Aegean’s losses have been more evenly distributed across the grains, sugarbeet, and “other crops” categories. In the livestock sector, the most affected region has been Marmara, in which the milk, sheep, cattle meet, and poultry sub-sectors have suffered equally. Central Anatolia has been the second hardest hit, with large reductions in support in the areas of milk and cattle meet. The Aegean and Black Sea regions are the next most affected, with losses distributed evenly in much the same pattern as in Marmara. Eastern Anatolia has had the most losses in the milk sector, while the Mediterranean and Southeast Anatolia have experienced relatively greater losses in sheep raising.

Table 2.6¹⁶ - Regional PSEs by Crops and Livestock Product, 1999 and 2001, Billion Real 2001 TL

¹⁶ <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

	1999	Mediterranean	East Anatolia	Aegean	South East A.	Central A.	Black Sea	Marmara	Turkey
Crops	Wheat	213,995	91,632	114,205	122,191	380,724	142,287	189,358	1,254,391
	Maize	60,115	438	10,267	2,468	380	42,328	25,563	141,558
	Other grain	31,246	37,849	65,681	54,610	221,475	47,573	57,354	515,788
	Sugar beets	48,840	94,044	68,024	2,789	464,672	139,491	43,033	860,893
	Oil seeds	21,490	954	13,618	2,838	11,952	6,934	99,012	156,797
	Other	385,682	64,406	389,842	166,980	264,909	286,771	250,822	1,809,413
	Total Crops	761,368	289,323	661,636	351,875	1,344,111	665,383	665,142	4,738,839
Livestock	Milk	115,381	181,127	111,046	69,111	164,547	177,952	148,933	968,097
	Sheep Meat	41,953	25,047	42,262	39,631	37,936	15,282	55,062	257,173
	Cattle Meat	62,149	110,755	197,267	30,191	228,906	165,513	243,241	1,038,022
	Poultry	5,671	15,933	51,549	2,184	40,172	91,562	142,929	350,001
	Hen Eggs	8,661	6,595	46,490	6,051	66,648	31,255	49,215	214,916
	Total Livestock	233,816	339,457	448,614	147,168	538,210	481,563	639,380	2,828,209
Total	995,183	628,781	1,110,250	499,043	1,882,321	1,146,947	1,304,522	7,567,047	
	2001	Mediterranean	East Anatolia	Aegean	South East A.	Central A.	Black Sea	Marmara	Turkey
Crops	Wheat	-26,032	-12,757	-13,738	-24,638	-38,108	-16,368	-25,616	-157,257
	Maize	7,313	36	1,623	414	249	5,364	5,068	20,067
	Other grain	2,665	3,536	4,731	10,649	13,599	4,022	5,018	44,220
	Sugar beets	11,926	25,479	17,375	596	89,758	25,799	13,248	184,181
	Oil seeds	13,501	513	8,574	1,218	4,789	2,496	40,901	71,992
	Other	338,392	54,581	307,534	158,532	196,835	226,840	196,521	1,479,235
	Total Crops	347,765	71,388	326,099	146,771	267,122	248,153	235,140	1,642,438

Livestock	Milk	46,392	62,882	38,868	24,891	63,642	59,867	52,936	349,478
	Sheep Meat	-16,284	-11,477	-18,512	-13,799	-17,453	-7,076	-28,147	-112,748
	Cattle Meat	43,846	71,365	108,401	17,441	117,969	107,750	139,123	605,895
	Poultry	10,765	3,498	12,473	224	10,413	34,494	56,456	128,323
	Hen Eggs	8,036	5,142	40,208	5,665	37,834	24,987	29,730	151,602
	Total Livestock	92,755	131,410	181,438	34,422	212,405	220,022	250,098	1,122,550
Total		440,520	202,798	507,537	181,193	479,527	468,175	485,238	2,764,988
	Change, 2001-1999		East Anatolia	Aegean	South East A.	Central A.	Black Sea	Marmara	Turkey
Crops	Wheat	-240,027	-104,389	-127,943	-146,829	-418,832	-158,655	-214,974	-1,411,648
	Maize	-52,802	-402	-8,644	-2,054	-131	-36,964	-20,495	-121,491
	Other grain	-28,581	-34,313	-60,950	-43,961	-207,876	-43,551	-52,336	-471,568
	Sugar beets	-36,914	-68,565	-50,649	-2,193	-374,914	-113,692	-29,785	-676,712
	Oil seeds	-7,989	-441	-5,044	-1,620	-7,163	-4,438	-58,111	-84,805
	Other	-47,290	-9,825	-82,308	-8,448	-68,074	-59,931	-54,301	-330,178
	Total Crops	-413,603	-217,935	-335,537	-205,104	-1,076,989	-417,230	-430,002	-3,096,401
	%	-54%	-75%	-51%	-58%	-80%	-63%	-65%	-65%
Livestock	Milk	-68,989	-118,245	-72,178	-44,220	-100,905	-118,085	-95,997	-618,619
	Sheep Meat	-58,237	-36,524	-60,774	-53,430	-55,389	-22,358	-83,209	-369,921
	Cattle Meat	-18,303	-39,390	-88,866	-12,750	-110,937	-57,763	-104,118	-432,127
	Poultry	5,094	-12,435	-39,076	-1,960	-29,759	-57,068	-86,473	-221,678
	Hen Eggs	-625	-1,453	-6,282	-386	-28,814	-6,268	-19,485	-63,314
	Total Livestock	-141,061	-208,047	-267,176	-112,746	-325,805	-261,541	-389,282	-1,705,659
	%	-60%	-61%	-60%	-77%	-61%	-54%	-61%	-60%
Total	Change	-554,663	-425,983	-602,713	-317,850	-1,402,794	-678,772	-819,284	-4,802,059
	%	-56%	-68%	-54%	-64%	-75%	-59%	-63%	-63%

Source: OECD and own calculations.

1.4.7. The results of DIS program¹⁷.

The DIS Program has played a strong role in supplementing rural income in the aftermath of the substantial reductions in agricultural subsidization and the downturn in agricultural value added associated with the reforms and the 2001 recession. In a 2002 survey of village households conducted under the Agricultural Reform Implementation Project (ARIP), known as the Quantitative Household Survey (QHS) the DIS payments were shown to account for 7 to 8 percent of household income. Given the evolution of the ratio of net agricultural income to gross agricultural income over the reform period, it appears from the QHS results that the DIS Program is replacing about 40 percent of the net income loss which farmers have experienced. Clearly, the reform of agricultural subsidies and introduction of DIS could not

¹⁷ <http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1121189080247/turkey-ag-complete.pdf>

have been expected to date to achieve the pre-reform level of agricultural income, especially for the more commercially oriented farmers who were the most responsive to agricultural policies and received the largest share of subsidies in the past. In 2003, DIS payments reached about US \$1.56 billion and replaced over 50 percent of farmers' income loss.

Obviously, this affects only those who have actually been able to access the DIS Program, which in 2002 included over three-quarters of the farming population. Registration rates have been the highest in the Central Anatolia region. In addition, the national trend of continued higher shares of registered farmers than land areas was particularly marked in the South East Anatolia region, likely owing to the greater frequency of cadastral registration problems there. The most common reason cited by households for not participating in DIS is that they did not believe they were eligible to enter the program. Thus, improving dissemination of information on eligibility criteria, particularly in areas with high numbers of sharecroppers and farmers with land not registered in the cadastre, may help raise the participation rates. Analysis of the QHS data for 2002 indicate that relative to 2001, the area sown to grains (mainly wheat and barley) has fallen, while the areas sown to sunflower and fruits and vegetables have increased. This is in line with what would be expected as a result of the change in agricultural subsidy policies and represents an acceleration of the shifts observed in 1999-2001. Having constructed a model of gross agricultural income based on the QHS data set, the Review's analysis indicates that those households with greater relative wheat specialization, tobacco specialization, and barley specialization, all experience a significantly negative impact on agricultural income. These findings are in accordance with the expected results since tobacco prices have fallen the most of all crops, and the PSEs for wheat and other grains (mainly barley) fell from over 40 percent in 1999 to near zero in 2001. Those households with greater relative specialization in sunflowers have experienced a positive impact on agricultural income, which reflects the high support still accorded to this crop. The model results also indicate that the impact of the DIS Program on farmer's welfare has been significantly positive: one million TL paid in DIS generates approximately 2.5 million in gross agricultural value added. However, the model results reveal no significantly differential impact of DIS on the poor as opposed to nonpoor farming families.

1.4.8. Turkish agriculture and European Accession¹⁸

Turkey is associated member of the European Union. The Turkish government shall to take the necessary measures to improve the agriculture of the country and to make it adequate to the European Standards. However, according to the last Regular Report, which is concerning 2004, limited progress in the field of agriculture and rural development has been reported. Since 2001 Turkey has been implementing an agricultural reform programme, the Agricultural Reform Implementation Project (ARIP), with support from the World Bank. The project has been extended for the period 2005-2007. In addition to direct income support, several new sub-components have been included to help farmers in the transitional period (e.g., land consolidation, village based participatory investments, institutional reinforcement of agricultural sales cooperatives and unions).

In December 2004, Turkey adopted an agricultural strategy which indicates the strategic objectives and instruments of agricultural support in the period 2006-2010. The strategy paper will form the basis for the Agriculture Framework Law. Whilst this strategy contains some welcome elements (for example a commitment to create a sustainable, competitive agri-food sector, to improve food safety standards, to encourage diversification and to support agrienvironment scheme), it also represents a step backwards in some important respects. For example the direct payment system, whose share is to decline from 76 % to 45% out of the total agricultural budget, is to be re-coupled to focus on specific crops. Production linked premia are to be increased, and deficiency payments increased to stimulate production of crops for which Turkey is not self-sufficient. These changes represent not only a step back from the agricultural reform programme pursued by Turkey in recent years but also represents a development that goes against the directions of the Common Agricultural Policy as reformed in 2003 and 2004. This tendency gives rise to some concern. The administrative capacity of the Ministry of Agriculture and Rural Affairs has not been reinforced since last year's report. The same competences are often shared between different general directorates and/or departments leading to unclear responsibilities or conflicts of competences and does not contribute to efficient administration. The public reform law providing the legal basis for the restructuring of the Ministry of Agriculture and Rural Affairs has not yet entered into force.

¹⁸http://ec.europa.eu/enlargement/archives/pdf/key_documents/2005/package/sec_1426_final_progress_report_tr_en.pdf

On the *Integrated Administration and Control System (IACS)*, some limited progress can be reported in the context of an EU-funded pre-accession project. Due to start this year, this project will use pilot projects to test different methods of building the Land Parcel Identification System (LPIS) and will identify the legal and institutional developments required for a functioning IACS system.

Little progress can be reported on *quality policy* or *organic farming*, although, as noted in last year's Regular Report, Turkish national schemes already approach those specified in the EU *acquis*. The new framework law concerning organic farming was adopted by the Parliament in December 2004. The law stipulates the production methods for organic products and lays down the responsibilities of the Ministry of Agriculture and Rural Affairs. It provides for control and certification services, import and export rules and advertising of organic products. No progress can be reported on the Farm Accountancy Data Network (FADN). No progress has been made regarding *state aid* legislation in the agriculture sector. Although the elimination of input subsidies was one of the objectives of the Agriculture Reform Implementation Project, the Turkish Prime Minister announced to grant input subsidies again in 2005, e.g., for diesel and fertilizer.

No developments are to be reported as regards the **common market organisations** or associated trade mechanisms (export refunds, import quota licensing etc). This is not however a cause for concern at this stage in the pre-accession process. A new regulation concerning the establishment of agriculture producer organisations has been published. The regulation determines certain production levels for the recognition of producer organisations. Organic and fisheries products are also concerned. Some progress can be reported on **rural development**. The Ministry of Agriculture and Rural Affairs together with the Turkish state planning organization has drafted a rural development strategy and work is starting in the context of an EU-funded project on a national rural development plan. Turkey has also recently started preparing for the implementation of IPA (rural development component (IPARD)), for which Turkey will be eligible from 1 January 2007. Turkey has now set up two working groups in this area, one of which will support the managing authority in defining the IPARD programme and one which will be responsible for building up the IPARD agency. Given the deadline of 1 January 2007, Turkey needs to take urgent political decisions in this area to secure the timely disbursement of IPARD funds.

1.5. Seed industry in Turkey

Turkey's domestic seed production is not sufficient to meet the local demand, despite the privatization of the industry in the 1980s and continued government support. The development of the industry is expected to be better after several new laws and regulations, which have been prepared by the Government of Turkey (GOT), are adopted over the next few years. Turkey imported over USD 65 million of seeds in 2004 with the European Union supplying the majority of seeds to Turkey. The United States exported USD 9.1 million worth of seeds to Turkey in 2004, primarily corn, vegetable and fodder crop seeds. Seed exports decreased during the first nine months in 2005. In general, the duty is zero for seed imports, except for flower and ornamental seeds imported for commercial purposes.

The registration, control and certification facilities of seeds are executed by the Ministry of Agriculture and Rural Affairs, General Directorate of Control and Certification of Seeds (*Tarım Bakanlığı Ziraat İşleri Genel Müdürlüğü, Tohumluk Kontrol ve Sertifikasyon Şubesi Müdürlüğü*). Also the Institute, Station and Laboratories of Control and Certification of Seeds (*Tohumluk Kontrol ve Sertifikasyon Enstitüsü, İstasyon ve Laboratuvarları*) and the other authorised institutions help the execution.

Plant breeding is performed by both the public and private sectors¹⁹. Several public institutions are involved in plant breeding, including Çukurova Agricultural Research Institute (Adana); Mediterranean Agricultural Research Institute (Antalya); Aegean Agricultural Research Institute (Menemen-Izmir); Southern Anatolia Agricultural Research Institute (Diyarbakir); Eastern Anatolia Agricultural Research (Erzurum); Black Sea Agricultural Research Institute (Samsun); Trakya Agricultural Research Institute (Edirne); Geçit Kusagi Agricultural Research Institute (Eskinşehir); Forage Crops Research Institute (Yalova-Istanbul); Vegetable Research Institute (Antalya); Agricultural Research Institute (Akçakale); Bahri Dagdas Winter Cereal International Research Institute (Konya); and the Maize Research Institute (Sakarya).

The official body for variety release is the Variety Release Committee composed of members of research institutes of the Ministry of Agriculture, Forestry and Rural Affairs (MAFRA), Faculty of Agriculture, and Variety Registration and Certification Institute. The agency

¹⁹ <http://www.fao.org/docrep/005/Y2722E/y2722e15.htm>

responsible for variety registration is the Directorate of Seed Registration and Certification Centre in Ankara.

Public and private seed production organizations are present, as well as multinationals (Pioneer, Cargill, CIBA-GEIGY, Sandoz, etc.). Among the public organizations, the most important are: TIGEM in Ankara (public sector); T.Z.D.K. in Ankara (public sector); and Antbirlik in Antalya (public sector).

MAFRA enforces seed law, since 1963. Seven official Seed Testing and Certification Stations are present in the country at Ankara, Gebze-Kocaeli, Izmir, Antalya, İçel, Diyarbakir, and Samsun. Seed testing is carried out according to ISTA Rules.

Seed processing is performed by public (TIGEM, T.Z.D.K.) as well as private sector entities.

The seed producing organizations market their seeds through their own outlets and agencies. Seeds are transported mainly by trucks and other road vehicles. Seed production and marketing activities in the public and private sectors are based on a free market economy. Prices are not controlled. Trade in seed of foreign origin is subject to legal restrictions.

Demonstrations are conducted by the Provincial Seed Testing and Certification Stations and also private organizations, under farm conditions, for the promotion of new seed varieties.

2. IP LAWS AND REGULATIONS

2.1. International treaties*

Turkey has ratified the following international treaties regarding plant variety law:

- European Patent Convention signed in 1973²⁰.
- Budapest Treaty on the International Recognition of the Deposit of Micro-organisms for the Purposes of Patent Procedure, called Budapest Treaty, signed in 1977²¹.

* Prepared by Dr. B. Yildiz.

²⁰ Entered into force by 1st of November 2000.

²¹ Entered into force by 30th of October 1998.

- Agreement Establishing The World Trade Organization, signed in 1967 and Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) signed in 1994²².
- Turkey has not been a member of International Convention for the Protection of New Varieties of Plants (UPOV Convention), of December 2, 1961, yet. The application of Turkey in October 2004 to UPOV for the membership has been accepted; however the Great National Assembly of Turkey has not enacted the relevant approval code yet.
- Turkey is only an associated Member of the European Community. The system of Community plant variety rights, which is established on the basis of the Council Regulation (EC) No. 2100/94 of 27 July 1994, does not yet have direct effect within the territory of the country.

2.2. National legal system for protection of the plant varieties*.

2.2.1. National sources of law.

Under Turkish law, new varieties of plants are protected by the following legal acts:

- Code on Protection of Breeder's Rights for New Plant Varieties ("*Yeni Bitki Çeşitlerine Ait Islahçı Haklarının Korunmasına İlişkin Kanun*"), 5042 numbered and 8 January 2004 dated²³.
- Directive on the register of new plant varieties²⁴ (*Bitki Çeşitlerinin Tescil Edilmesine İlişkin Yönetmelik*)
- Directive on Protection of Breeder's Rights for New Plant Varieties²⁵ (*Yeni Bitki Çeşitlerine Ait Islahçı Haklarının Korunmasına Dair Yönetmelik*).

2.2.2. The protection of plant variety in Turkey

2.2.2.1. The recent law

As a result of Turkey's possible future accession to the European Union and moves towards to the global harmonization of IP protection in an emerging economy, in recent years Turkey has

²² Entered into force by 26th of March 1995.

* Prepared by Dr. B. Yıldız.

²³ OJ 15.01.2004, S. 25347.

²⁴ OJ 19.09.1997-23115. (Amended by OJ 11.11.2004-25640).

²⁵ RG. 12.08.2004/25551.

made major advances in IP law, not only through new regulations, but also in the enforcement of IP rights²⁶. In the last decade, Turkey changed from a state-directed economy system to a free market system. The transformation involved reforms across the board, including a revamp of the IP system. As part of its harmonisation, and efforts towards adopting EU IP rights legislation, and in accordance with its commitments under the World Trade Organisation Agreement on Trade-Related Aspects of IP Rights, since 1994 Turkey has introduced numerous new laws, decrees and regulations that have established a stable, reliable IP system that can support competitive business development.

In accordance with Annex 8 of the Decision No. 1/95 of the EC-Turkey Association Council of 22 December 1995²⁷, Turkey has undertaken to align its domestic intellectual property legislation with that of the European Communities. Towards this goal, the Code on Protection of Breeder's Rights for New Plant Varieties was enacted in January 2004. By this Code, the breeders are granted exclusive rights for the first time in Turkish law. Although Turkey has not been a member of UPOV yet, the Code on Protection of Breeder's Rights for New Plant Varieties is predicated on the International Convention for the Protection of New Varieties of Plants, text of 1991. Even many articles of the Code directly cross-refer to the provisions of UPOV Convention. Beside the UPOV Convention, The Code numbered 5042 is also in conformity with the Acquis Communautaire. It is especially predicated on the 2100/94/EC, 1768/95/EC ve 2470/96/EC regulations of EC.

The objective of this Code is to encourage the development of plant varieties and to ensure protection of new varieties and breeder's rights (art. 1, para. 1). It covers all plants. According to the Code, the protection is granted to breeders by a certificate ("*İslahçı Hakkı Belgesi*"), given by the Ministry of Agriculture and Rural Affairs, General Directorate of Protection and Control (*Tarım ve Köy İşleri Bakanlığı, Koruma ve Kontrol Genel Müdürlüğü*). In order to benefit from the protection provided by the Code, owner of the variety shall apply to the Ministry. The Ministry shall carry out formal and substantive examination of the application. When the Ministry establishes, on the basis of examination, the applicant has followed the procedures laid down in the Code, it shall enter the breeders right in the Breeder's Right Register and supply the holder a certified Breeder's Right Document.

²⁶ Dereligil, E. and Yılmaz, S., "Turkey - Recent changes in IP law", IP Value, 2006, p.303 - 307

²⁷ Decision No. 1/95 of the EC-Turkey Association Council of 22 December 1995 on implementing the final phase of the Customs Union (96/142/EC).

2.2.2.2. Conditions of Protection:

The Code protects the plant varieties which are new, distinct, uniform and stable, provided that other requirements under the Code are met (art. 3).

Novelty: Under Turkish law, a variety shall be deemed to be new if, at the date of filing of the application for a breeder's right, propagating or harvested material of the variety has not been sold or otherwise disposed of to public, by or with the consent of the breeder, for purposes of using exploitation of the variety, at home where the application has been filed earlier than one year before that date, and abroad earlier than four years or, in the case of trees or of vines, earlier than six years before the said date (Art. 5, para. 1).

However, following cases shall not affect the consideration of variety as new:

- a. Sales or statements that can be considered, against the holder of the right, as misuse of right,
- b. Sales or statements that are within the scope of a transfer contract of breeder's right.
- c. Acts, on behalf of the holder, under a propagating contract of material, provided that the breeder preserves the right on propagating material and material is not exploited for production of any other variety.
- d. Field or laboratory trials carried out, under a contract, in order to determine the characteristics of the variety or acts related with small size product processing trials.
- e. Acts arising from legal procedures for biological security or from the obligations such as entering tradable varieties in the official catalogue.
- f. Sales or disposal to the public, for consumption and without defining the variety concerned, of residual products resulting from production of variety or of harvested material of subproduct nature, or materials resulting as the consequence of acts under paragraph (c), (d) and (e) of this Article.

Distinctness: Under Turkish law, a variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge on the date of application or on the date of priority right. A variety shall in particular be deemed to be a matter of common knowledge on the date of application provided that an application

filed in any State has led to the granting of breeders right or entering the variety in the register. Common knowledge may also be determined by taking into account the commencement of variety exploitation or existence of a variety in a variety catalogue of a professional institution or inclusion in a reference collection.

Uniformity: A variety shall be deemed to be uniform if it is sufficiently uniform in its relevant characteristics, except those possible variations that are subject to propagation method used (art. 7)

Stability: A variety shall be deemed to be stable if its relevant characteristics remain unchanged during the repeated propagation or at the end of particular propagation cycles (art. 8)

2.2.2.3. Persons Benefitting from Protection

The protection under this Code shall be provided to persons who are the nationals of Republic of Turkey or natural or legal persons having their residences or offices within the territory of Republic of Turkey or those having the right to apply within the scope of the UPOV Convention (art. 4).

In line with the reciprocity principle, natural and legal persons who does not meet the requirements given in paragraph 1 but are nationals of any other state that grants legal or actual protection to the nationals of Republic of Turkey shall also enjoy the same protection provided by this Law.

2.2.2.4. Holder of Right

Under Turkish law, breeder is defined as the person who bred or discovered and developed a new plant variety. Any breeder or his legal successors are accepted as “Holder of the Right” and shall be entitled to the breeder’s right of a variety.

In case of breeders more than one person, the entitlement shall be vested jointly in them provided that there is no contrary agreement between respective parties.

Each holder of the right is entitled to do following on his own right, independently of other shareholders:

- a. He may exercise his right freely in proportion to the respective share held.

b. He may exploit the variety in question after written notification to other holders of the right.

c. He may take any measure necessary for protection of variety concerned.

d. He may institute legal and criminal proceedings against 3rd persons in cases where infringement of the right which results from joint application to the Ministry or granting of the right.

In cases where the holder institutes legal or criminal proceedings against 3rd persons, the plaintiff shall inform other shareholders, within one month from date of the institution of the proceedings, in order to enable them to participate to the proceedings.

In case of transfer of right to 3rd parties, other shareholders have the priority purchase right. The transfer of right shall be made in writing and entered in the register. The Ministry shall inform other shareholders, within 2 months, of the situation to ensure them to exercise their priority purchase right. The priority purchase right shall be exploited within one month from the date of receipt of such notification.

In cases where transfer of the right with regard to exploitation of the variety to 3rd persons is not possible with the consent of all holders, the decision on the transfer of such right shall be taken by the Court.

2.2.2.5. Entitlement under Employment

Where the varieties are bred or discovered and developed by employees during the execution of their duties, the breeder's right shall be vested in their employers unless otherwise provided by the contract or understood from the nature of the work.

The breeder's right shall be vested in the employers for the variety that has been bred, discovered or developed by the employee, using the information and equipment available at work, who were not required by the contract.

The employees who bred or discovered and developed the varieties may claim a certain amount of remuneration determined by breeder and employer by taking into account the economic value of the variety. When the parties do not agree on the level of remuneration, it shall be decided by the Court. The parties may determine the level beforehand and so include in the contract.

Which employees of public institutions and agencies will benefit from the breeder's right, to what extent and how, shall be determined by a Regulation to be adopted by the Ministry after receiving the observations of relevant ministries.

2.2.2.6. Entitlements Under Contracts other than Service Contracts

For the varieties that have been bred or discovered and developed within the framework of employment contracts other than service contracts, the right shall be vested in the client unless otherwise provided by the contract.

2.2.3. SCOPE of THE PROTECTION

2.2.3.1. Rights Conferred on the Holder

Breeder's right shall confer on the holder following exclusive rights for protection of the variety:

- a. production or reproduction.
- b. conditioning for the purpose of propagation.
- c. offering for sale.
- d. selling or other marketing.
- e. exporting or importing.
- f. stocking.

2.2.3.2. Restrictions on Exercise of Breeder's Right

General Restrictions

According to the article 16, the breeder's rights shall not extend to the following acts:

- (a) acts done privately and for non-commercial purposes;
- (b) acts done for experimental purposes;
- (c) acts done for the purpose of breeding other varieties, except acts referred in Article 14 paragraph 5 of the Code.

Derogation for Farmers

According to the article 17 for the purposes of protecting and safeguarding agricultural production, farmers are authorized to use for new production, on their own holdings, the product of the harvest which they have obtained by planting propagating material of a protected variety, except hybrid and sythetic varieties, without infringing the legitimate rights of breeder, provided that it is not contrary to paragraph 1 of Article 14. This rule shall be observed to following species:

(a) Cereals

- 1- Wheat “Triticum spp”
- 2- Barley “Hordeum vulgare L.”
- 3- Red rice “Oryza sativa L.”
- 3- Oats “Avena sativa”
- 4- Rye “Secale cereale L.”
- 5- Tricale “Triticosecale”

(b) Grain Legumes

- 1- Common bean “Phaseolus vulgaris L.”
- 2- Chickpea milkvetch “Cicer arietinum L.”
- 3- Lentil “Lens Culinaris Medic”
- 3- Field pea “Pisum sativum L.”
- 4- Field bean “Vicia faba “

(c) Fibre Plants

- 1- Lucerne “Medicago sativa L.”
- 2- Sainfoin “Onobrychis Sativa L.”
- 3- Common vetch “Vicia sativa L.”
- 4- Clover “Trifolium spp.”

(d) Industrial Plants

- 1- Cotton “Gossypium spp.”

- 2- Tobacco “Nicotina tacacum L.”
- 3- Potato “Solanum tuberosum”
- 3- Rape “Brassica tuberosum L.”
- 4- Peanut “Arachic hypogaea L.”
- 5- Soybean “Glycine Max L.”

2.2.4. DURATION of the PROTECTION

The duration of protection is 25 years from the grant of the right. For trees, vines and potatoes, the said period is 30 years from the said date.

2.2.5. REGISTRATION PROCEDURE

In order to benefit from the protection provided by the Code, owner of the variety shall apply the Ministry of Agriculture and Rural Affairs (art. 32). The Ministry shall carry out formal and substantive examination of the application.

All applications that are complete and accurate shall be entered in the register and given an application number. The date on which documents referred in Article 33 are received by the Ministry shall be deemed as the application date. Within 30 days following the entering the application in the Register, the Ministry shall publish, on the bulletin, the documents required in paragraph 1 indents (a) to (e) of Article 33.

Any objection to the application shall be lodged with the Ministry, within three months following the publication of the application on the Bulletin.

Upon the expiry of the period for objection to the breeder’s right application, the Ministry shall notify the applicant on the objections lodged and require the applicant to furnish, within 3 months, his observations against the objections and inform the Ministry whether he still maintains his application or claims amendment to the application.

When the Ministry establishes, on the basis of examination, the applicant is within the scope of Article 4 and has followed the procedures laid down in this Law, it shall enter the breeders right in the Register and supply the holder a certified Breeder’s Right Document.

The Breeder's Right Register constitute Application and Breeder's right registers²⁸.

The grant of the Breeder's right for a protected variety shall be published in the Plant Varieties Bulletin within 30 days from the date of grant. Third persons may lodge, within 30 days from the date on which the breeder's right is published on the Bulletin, with the ministry, an objection to the grant of a right on the grounds that there were deficiencies in the procedures laid down in Articles 32, 33, 34, 36, 39,40,41 and 44.

During the course of examination conducted by the Ministry, if it is established that one of the procedures for granting the right has not been fulfilled, or a significant deficiency occurred in procedures, the Ministry may decide on that the granting procedure is invalid and go back to the point of procedure where the deficiency arised and renewal of the procedures.

If the application is incomplete or incorrect, the Ministry shall give the applicant an opportunity to correct any deficiencies within 30 days from the date of receiving such a communication. If deficiencies are not corrected by the applicant within that period, application shall be considered as not been made. If the Ministry finds, at the end of the examination, that there is an impediment to granting the breeder's right, it shall refuse the application. In 30 days from the date of such decision the Ministry shall inform the applicant, in writing, on the refusal decision together with its reasons.

If the applicant or his predecessor in title has already applied for a property right for the variety in a country party to the UPOV Convention, and the date of application is within 12 months of the filing of the earlier application, the applicant shall enjoy a right of priority for the earlier application as regards the application for the breeder's right in Turkey. In such a case the date of the application in any party to the UPOV Convention shall be deemed to be the date of application in Turkey.

2.2.3. Patent protection for plant varieties

As mentioned above, the EPC is in force for Turkey since 1 November 2000. By reason of that it is clearly stated in Decree No. 551 Relating to the Protection of Patents that the plant varieties do not fall under the patent system and can not be protected by the provisions on

²⁸ Any person may examine the documents relating to the application, grant of breeder's rights, and any other documents on the Register. The owner of the variety the production or reproduction of which requires repeated use of other varieties may request for withholding of all documents and tests, relating to the variety, from the inspection of register.

patent²⁹ (art. 6/b). This provision is in compliance with the certain exclusions in the Article 53 of the European Patent Convention namely:

“3. *Plant or animal varieties or essentially biological processes for obtaining them. This provision does not apply to microbiological processes or the products thereof.*”

2.3. General conditions for Seed certification under the Turkish law³⁰

Turkey is a member of ISTA since 1963. It is included in the OECD Seed Certification System for some plant species such as sugar beet, oil and fibre plants, cereals, oil seeds, fodder crops, maize and sorghum in 1968. There are equivalence of certification procedures for some species recognized by EU in 1989.

2.3.1. Legal framework

The national legal sources includes

- Code on the Registration, Control and Certification of Seeds³¹ (*Tohumlukların Tescil, Kontrol ve Sertifikasyonu Hakkında Kanun*).
- Code on Agricultural Combat and Quarantine³² (*Zirai Mücadele ve Zirai Karantina Kanunu*).
- Code on Protection of Breeder’s Rights for New Plant Varieties (“*Yeni Bitki Çeşitlerine Ait İslahçı Haklarının Korunmasına İlişkin Kanun*”), 5042 numbered and 8 January 2004 dated.
- Regulation on the Application of the Code on the Registration, Control and Certification of Seeds³³ (*Tohumluklarının Tescil, Kontrol ve Sertifikasyonu Hakkındaki Kanunun Uygulanmasına İlişkin Yönetmelik*).
- Regulation on the Registration of Plant Varieties³⁴ (*Bitki Çeşitlerinin Tescil Edilmesine İlişkin Yönetmelik*).

²⁹ RG.

³⁰ http://www.abgs.gov.tr/tarama/screening_files/12/SC12DET_Seedandpropagating.pdf#search=%22Turkey%20%2B%20%22plant%20varieties%22%22

³¹ Numbered 308, OJ. 29.8.1963, 11493; lastly amended in 2004.

³² Numbered 6968, OJ. 24.05.1957, 9615; lastly amended in 1988.

³³ OJ. 1.2.1964, 11622.

³⁴ OJ. 19.09.1997, 23115.

Turkish legislation on seeds is generally compatible with EU. Sampling and laboratory analyses are done under the ISTA Rules both in Turkey and EU. The variety registration for all species are also carried out under the UPOV Rules both in Turkey and EU.

Although the recent seed legislation in Turkey is adequate to the European law, a new Draft Seed Law is on the agenda of the Parliament. The main purpose of this Law is to give the private sector more control of the seed industry. According to the draft Law, an independent Turkish Seed Industry Union will be established and given a significant portion of the duties and responsibilities currently under the Ministry of Agriculture and Rural Affairs (MARA). Industry representatives expect the law to be adopted in 2006. The GOT is also developing a National Biosafety Law (NBL). Most of the technical work on the draft NBL has been completed. However, the law still must undergo several reviews before it is sent to the Prime Ministry. The law will focus on the production, use, importation and distribution of genetically modified materials. For seeds, the Law will provide a framework on the production and marketing of transgenic seeds should be possible. Currently, the GOT does not permit planting of bio-engineered seeds.

Utilization of certified seed has not developed well in Turkey, even though the GOT supports their use. However, certified seed use is expected to increase in the future in response to growing demand. The growth is expected especially for greenhouse vegetable, corn, sunflower, and fodder crop seeds.

Recently, the registration, control and certification facilities of seeds are executed by the Ministry of Agriculture and Rural Affairs, General Directorate of Control and Certification of Seeds (*Tarım Bakanlığı Ziraat İşleri Genel Müdürlüğü, Tohumluk Kontrol ve Sertifikasyon Şubesi Müdürlüğü*). Also the Institute, Station and Laboratories of Control and Certification of Seeds (*Tohumluk Kontrol ve Sertifikasyon Enstitüsü, İstasyon ve Laboratuvarları*) and the other authorised institutions help the execution.

2.3.2. Characteristics of the seed certification and marketing system.

2.3.2.5.The Turkish legislation is in compliance with the Implementing Regulation 2004/25376 on “Field Inspectors”. The field inspection on variety identification, variety purity, isolation requirements and diseases are carried out by authorized inspectors from the VRSCC (Variety Registration and Seed Certification Centre) and Regional Seed Certification Directorates or Provincial Directorates of MARA. All

marketed species are inspected according to methods and standards defined by MARA. •After inspection, a field inspection report is prepared for each and every seed production plot .

2.3.2.6.Sampling is carried out by an authorized inspector in accordance with the ISTA Rules.

•Sampling method, size of seed lot, minimum sample weight of marketed species are determined by MARA. •Samples in sealed packages are sent to the nearest regional certification laboratory for seed quality testing.

2.3.2.7.Seed testing is carried out by VRSCC and 5 regional seed certification laboratories.

Laboratory analyses are carried out under the ISTA rules. •Seed standards of the listed and marketed species are determined by the MARA. •Physical analyses (inert matter, other seed, wild seed etc.) and germination tests are compulsory for seed certification. Upon the results of laboratory analysis, seed samples which conform to the appropriate seed category standards are certified.

2.3.2.4 .Pursuant to Circular No.1998/410 on ‘‘Labels of certified seeds’’ Certified seed for varieties published in National Variety List is labeled by VRSCC and TURK-TED (Turkish Seed Industry Association). Label information and size depend on the category of seed. •A different serial number is given to each label for the purpose of tracing. •Label colors are in line with EU standards: Pre-basic seed White label with diagonal purple stripe; Basic Seed; White Registered Seed; White label with diagonal blue stripe; Cert.Seed 1st Generation Blue; Cert.Seed 2nd Generation Red; Not finally certified seed Gray.

2.3.2.5.Refer to the Post Control tests are carried out by VRSCC. 100% of the basic seeds and 10% of certified seeds lots are subject to Post Control tests. Results of the tests are evaluated and relevant institutions are notified by VRSCC

2.3.2.6.Market control is carried out by Provincial Directorates of MARA. Penalties related to ‘‘market control’’ violations are determined by various laws. Random samples during market controls are sent to the VRSCC and Regional Seed Certification Labs for testing.

2.3.3. Certification and propagation materials on VEGETABLE SEED

The certification on the vegetable seed is regulated on Instruction 1991/122367 on ‘‘Marketing of standard vegetable seed’’. Production is carried out by authorized producers. Producers are responsible for the maintenance of varietal purity, verification of name and compliance with seed quality standards. Market control is carried out by authorized

inspectors. Standard vegetable seed produced in accordance with this legislation is subject to post control tests.

All propagation processes are carried out according to Implementing Regulation 2004/25553 on “Supply, Production and Marketing with respect to Vegetable Seedling”. Seedlings belonging to the vegetable varieties in the Catalog are marketed only by controlling for diseases and quality standards.

2.3.4. Certification and propagation materials on FRUIT INCLUDING STRAWBERRY AND VINE

Propagation, certification and marketing of fruit and vine propagating materials are performed according to Communiqué 1997/22868 on “Certification of fruits and vine” • Seedlings belonging to the strawberry varieties in the Catalog are produced, certified and marketed in accordance with Communiqué 1999/23475 on “General principles with respect to the certification of strawberry seedlings”. Only the propagating materials of the listed fruit and vine varieties free of diseases are certified. Production of “controlled young plants” of varieties not listed in the catalog is also possible under this system only by carrying out inspection for particular plant diseases.

Refer to the Label Colors exist several categoris of production material label colour.

1. Stock material (Pre-basic) White
2. Stock material (identified as basic material) White
3. Certified young plants/young plants
propagation materials Blue
4. Certified young plants Blue

2.3.5. Certification and propagation materials on VEGETABLE SEED FORESTRY

The applicable rules are included in the Implementing Regulation no. 2006/20068 on “Marketing of Forest Reproductive Materials”. This legal act is in compliance with Directive 1999/105/EC. Its provision determine the principles on production, certification and marketing of forest tree propagation materials. The responsible body is the Ministry of Environment and Forestry.

2.3.6. Certification and propagation materials on ORNAMENTAL PLANTS

The special legal base includes Circular no. 2005/3 on “importing of ornamental plants and their propagating materials” and •Circular no. 2005/5 on “exporting of ornamental plants and their propagating materials”. Inspection is carried out by inspectors of Provincial Directorates of MARA only in terms of diseases subject to quarantine and then marketing is allowed .

2.3.7. Certification and propagation materials on GM PLANTS

Seed of GM plant varieties can not be imported , produced and marketed in Turkey. GM Plant Variety trials in limited areas for some species such as maize, sunflower, cotton, potato and soybean are allowed according to Instruction no. 1998/19 “on the field trials of transgenic plants”. Technical studies for “Bio-safety Law” are in progress.

2.4. Enforcement of intellectual property rights³⁵

Last years in Turkey some progress has been made concerning the enforcement of intellectual property rights. Specialised IPR courts have improved. Two additional IPR specialised courts function effectively, which brings the distribution of such courts as follows: 1 criminal and 3 civil IPR courts in Ankara, 2 civil and 3 criminal IPR courts in Istanbul and 1 criminal IPR court in Izmir. Further training on IPR was delivered to approximately 50 judges and prosecutors dealing with IPR cases in November 2004. However, some flaws still exist concerning the functioning of the TPI. For instance, registration procedures are considerably longer than the EU average transactions. In addition, some problems also remain concerning the judiciary. Right owners and attorneys faced increasing difficulties in obtaining search and seizure warrants from non-specialised lower courts. Sharp discrepancies among the decisions of lower court judges in different circuits undermine the success in enforcement made by specialised courts. Moreover, punishments have not proved deterrent even for counterfeiting actions involving threats to public health.

3. USE AND PRACTICAL ASPECTS

3.1. Seed Industry

3.1.1. Production³⁶

³⁵http://ec.europa.eu/enlargement/archives/pdf/key_documents/2005/package/sec_1426_final_progress_report_tr_en.pdf

³⁶ <http://www.fas.usda.gov/gainfiles/200511/146131648.pdf>

There are 128 private firms and 27 public entities that currently produce, procure, import and distribute seeds in Turkey. However, Turkey's domestic seed production is not sufficient to meet local demand especially for vegetables, fodder crops, pasture and meadow grasses, corn seeds, and seed potatoes. Ownership of the private companies ranges from 100 percent Turkish-owned to 100 percent foreign-owned, with various combinations in between. A private seed industry has been a relatively recent phenomenon in Turkey. Turkey became a member of the OECD certification system and International Seed Testing Association (ISTA) just a few years ago. In the past, the industry was dominated by government agencies, which even set selling prices until the 1980's when the sector was privatized and seed prices were liberalized. Local and international companies began investing in the seed sector shortly after that. The Turkish Seed Industry Association (TURK-TED) was established in 1986. The major function of TURK-TED is acting as powerful lobbying agent, contributing to the development of the sector, and assisting with the transition to the EU system. TURK-TED also assists member firms with studies on seed production, certification, storage, packaging, distribution, and variety breeding. TURK-TED currently has 75 members, which account for at least 90 percent of all private sector seed production. In 2004, privately owned firms produced either 100 percent or almost 100 percent of sunflower seeds, vegetable seeds, corn seeds, and seed potatoes. Slightly more than 50 percent of fodder crop seeds, 20 percent of cottonseeds, 15 percent of barley seeds, and 5 percent of wheat seeds were also produced by the private sector in Turkey.

The Production and Development General Directorate (TUGEM) of the Ministry of Agriculture announces a Production Program, which sets production goals for the Turkish sector each year. The program is established jointly with both public and private seed producers based on the country's domestic needs as well as export goals. The program's goals are not always met which necessitates the use of stocks, as was illustrated in Table 1. Even though they are significantly reduced, illegal entries of expensive greenhouse vegetable seeds continue to create unfair competition against firms, which are investing in this sector.

Table 1: Certified Seed Produced and Distributed in 2004 and Programmed in 2005

Type of Seed	Programmed for 2004 (MT)	Produced in 2004 (MT)	Distributed in 2004 (MT)	Programmed for 2005 (MT)
Wheat	299,490	223,094	229,029	266,845
Barley	20,602	19,074	18,499	29,825
Corn	8,812	17,767	13,762	18,922
Paddy rice	1,559	1,221	1,297	1,707
Chick peas	102	162	59	140
Dry beans	22	0	2	0
Sunflower	5,036	3,215	2,019	3,398
Potatoes	85,980	38,518	40,406	90,056
Soybeans	697	292	332	501
Peanuts	300	0	21	0
Sesame	3	0	0	0
Cotton	9,000	18,957	11,815	13,020
Vegetable	1,391	1,410	3,227	2,336
Alfalfa	488	446	473	635
Sainfoin	1,550	942	1,414	1,050
Vetch	2,711	1,891	1,957	1,742
Fodder beets	70	35	40	72
Sudan grass	6	10	5	11
Sorghum	0	4	0	82
Sorghum x Sudan grass	140	50	60	220
Pasture and meadow	755	499	2,230	801
Sugar beets	2,940	2,450	1,192	3,280

Source: 2005 National Seed Procurement, Distribution, and Production Program

3.1.2. Consumption³⁷

Certified seed utilization has not developed well primarily due to the lack of the education on the part of farmers and economic situation in Turkey. Approximately thirty-five percent of Turkey's population resides in rural areas and many are subsistence farmers. However, they are the least educated and having some of the lowest income levels in the country. As a result, their ability to buy certified seeds is limited. Nonetheless, certified seed utilization is expected to grow in the future in response to growing demand, especially for greenhouse vegetable and corn seeds. Demand for hybrid sunflower and fodder crop seeds are also expected to increase. GOT limits imports on poultry and livestock as well as high tariff rates on other products are encouraging domestic livestock production and, as a result, increased crop production.

Crop production in The Southeastern Anatolia Project (GAP) has contributed to the increased demand for seeds. Cotton has been the most popular crop for farmers using irrigated fields in the GAP area. Production of other crops, especially corn, is expected to grow in the region. The GOT is supporting the livestock sector, which in turn, is encouraging farmers to use more fodder crop seeds.

³⁷ <http://www.fas.usda.gov/gainfiles/200511/146131648.pdf>

Certified seed utilization varies a lot by type of seed. Table 2 represents certified seed needs, distribution, and ratios of the certified seed distribution over total need by seed variety in Turkey. As Table 2 indicates, farmers' use of certified seed is much less compared to expected demand.

Table 2: Seed Demand, Distribution, and the Ratio of Distribution/Need

Type of Seed	Planting Area (000 Ha)	Seed Need (Kg/Ha)	Replace Period (Year)	Est Total Seed Need (MT)	Distributed in 2004 (MT)	Ratio of Dist/Need (%)
Wheat	9,100	200	3	606,667	229,029	38
Barley	3,400	200	3	226,667	18,499	8
Hybrid corn	560	30	1	16,800	13,762	82
Paddy rice	65	200	2	6,500	1,297	20
Chick peas	630	100	5	12,600	59	0.47
Dry beans	162	100	5	3,240	2	0.06
Hybrid Sunflower	545	4	1	2,180	2,019	93
Potatoes	195	3,000	2	292,500	40,406	14
Soybeans	27	90	1	2,430	332	14
Rape seed	3	10	1	28	7	25
Peanuts	28	50	1	1,400	21	2
Cotton	630	20	1	12,592	11,815	94
Vegetable	1,040		1		3,227	
Alfalfa	290	20	4	1,450	473	33
Sainfoin	108	80	3	2,880	1,414	49
Vetch	250	90	5	4,500	1,957	43
Sudan grass	8	30	2	122	5	4
Fodder beets	3	30	2	51	40	78
Sugar beets	315	4	1	1,261	1,192	95

Source: 2005 National Seed Procurement, Distribution, and Production Program

3.1.3. The General Directorate of Agricultural Enterprises (TIGEM)³⁸

TIGEM which operates under the Ministry of Agriculture, is TURK-TED's only public member. TIGEM has been the major government entity carrying out seed propagation and distribution more than fifty years. TIGEM is still a significant producer of cereal, cotton, and fodder crop seeds, even though its responsibilities have significantly diminished in recent decades. With an agreement by TIGEM, private sector companies also produce cotton and corn seeds on TIGEM farms where crop rotation is applied. In 2004, about 25 percent of cotton and 15 percent of corn seeds produced by the private sector were produced on TIGEM farms in addition to those produced directly by TIGEM farms. The GOT eliminated most of the subsidies and now TIGEM farms are operating under more commercial terms. (However, they still do not pay rent for their land.) Table 3 provides total quantities of seeds (certified at all levels plus controlled) produced and distributed in 2004 and produced in 2005 by TIGEM.

³⁸ <http://www.fas.usda.gov/gainfiles/200511/146131648.pdf>

TIGEM also produces seeds to be planted on their own farms in addition to those provided in Table 3.

Table 3: Seeds Prepared, Distributed and Produced 2004 by TIGEM

Type of Seed	Prepared in 2004 (MT)	Distributed in 2004 (MT)	Produced in 2005 (MT)
Wheat	280,703	163,165	284,530
Barley	20,160	16,587	21,832
Rye	22	15	0
Cotton	494	53	200
Corn	367	355	600
Sunflower	50	22	29
Chick peas	37	7	122
Red lentils	550	550	352
Paddy rice	268	264	486
Alfalfa	237	221	139
Sainfoin	1,483	1,224	1,086
Vetch	1,888	1,311	1,895
Pasture and meadow	22	15	10

Source: The General Directorate of Agricultural Enterprises (TIGEM)

3.1.4. Trade³⁹

Due to shortfalls in production and quality, Turkey must import most seed varieties. Corn, sunflower, cotton, vegetable, and fodder crop seeds as well as seed potatoes are the most prominent imports. Depending on supply and demand, other seed varieties may also need to be imported. Turkey imported wheat, paddy rice, and soybean seed in 2004 and sugar beat and pulse seeds in 2004 and 2005. The current regulation on Plant Quarantine hinders imports of seed and has created significant problems. All imported seed must be tested. Tests on imports take long time, usually about a week, because customs do not have laboratories and samples are sent to the nearest research institutes. This time is even longer, if there is a dispute on findings since reference laboratory is in Ankara. Some new laboratories at customs were set up recently and some others were planned which will hopefully alleviate the situation. Importers also need import licenses to import seed and only those firms, which are producing, procuring, and marketing seeds domestically are provided import licenses. Turkey imported approximately 27 TMT of planting seeds worth approximately USD 69 million in 2004. During the first nine months of 2005, Turkey imported approximately 25 TMT of seeds worth of approximately USD 72 million. U.S. seed exports to Turkey have decreased slightly in 2005, from around USD 9.1 million in 2004 to about USD 8.4 million during the first nine months of 2005. Most of this change was due to decreased imports of vegetable and fodder

³⁹ <http://www.fas.usda.gov/gainfiles/200511/146131648.pdf>

crop seeds. The value of vegetable seed imports decreased from approximately USD 1.9 million in 2004 to approximately USD 1.0 million during the first nine months in 2005. Similarly, the value of fodder crop seed imports decreased from approximately USD 1.0 million in 2004 to USD 269,000 during the same period. However, the value of corn seed imports increased during the same period from approximately USD 6 million to approximately USD 6.9 million.

Turkey exported approximately 19 TMT of seeds worth approximately USD 31 million in 2004. However, Turkey exported fewer seeds, approximately 6.8 TMT worth approximately USD 19 million during the first nine months of 2005. Decreases were especially significant in corn seeds because, due to large demand, producers preferred to market their production in Turkey. On the other hand, exports of cottonseeds in 2005 are exceeding exports in 2004-second year in a row.

TIGEM is the only public entity involved in seed trade. TIGEM imported 40 MT parent wheat seeds from France and Italy, but did not export any seeds in 2004. In 2005, TIGEM imported 20 MT of parent wheat seed from France and exported 10 MT of wheat seed to Azerbaijan.

Turkey's seed imports and exports are provided in Table 4 and 5, respectively.

Table 4: Turkey's Seed Imports

Type of Seeds	Total & Country 2003	Quantity 2004 (MT)	Value 2004 (USD 1000)	Total & Country 2005 (Jan-Sep)	Quantity 2005 (Jan-Sep) (MT)	Value 2005 (Jan-Sep) (USD 1000)
Wheat	Total	781	490	Total	0	0
	Italy	661	391			
Corn	Total	13,655	11,900	Total	2,849	13,308
	USA	4,915	6,048	USA	402	6,883
	Spain	4,496	1,417	Spain	312	1,521
	Germany	1,373	414	Italy	226	1,038
	France	1,053	1,367	Hungary	209	525
	Serbia-Black	692	677	France	209	1,654
	Italy	586	657	Croatia	145	469
Paddy rice	Total	30	22	Total	0	0
	Italy	30	22			
Potatoes	Total	7,778	5,770	Total	9,225	6,571
	Netherlands	4,611	3,629	Netherlands	3,776	2,663
	Germany	896	708	Germany	2,948	2,615
	U. Kingdom	832	502	U. Kingdom	1,596	828
	Canada	654	367	Canada	650	298
	France	560	387	France	135	74
Pulses	Total	1,008	981	Total	182	243
	Hungary	588	669	Greece	140	168
	Canada	272	77	Germany	26	30
	Spain	68	91	Norway	6	8
	USA	19	33			
Soybeans	Total	5	9	Total	0	0
	Italy	5	9			
Sunflower	Total	76	2,402	Total	127	3,059
	France	41	1,852	France	60	2,058
	Australia	15	241	Serbia-Blac.	21	218
	USA	4	75	USA	18	144
Cotton	Total	323	803	Total	378	850
	Greece	99	345	Greece	161	303
	S. Africa	94	74	Australia	101	388
	Australia	73	295	South Africa	94	107
	USA	53	68	USA	18	46
Sugar beats	Total	94	897	Total	10	198
	Belgium	75	528	Sweden	6	174
	Germany	15	284	Belgium	2	19
Vegetables	Total	337	39,871	Total	9,144	40,919
	Netherlands	125	17,755	China	4,626	6,447
	Denmark	68	606	Ukraine	2,541	1,738
	Ukraine	48	2,409	Netherlands	110	14,920
	France	27	5,744	USA	18	1,013
	USA	16	1,863	France	17	4,748
	Chile	9	1,261	Chile	4	1,372
	Israel	5	6,263	Israel	3	5,637
Fodder crops	Total	2,778	5,436	Total	3,145	6,919
	Netherlands	609	1,261	Denmark	849	1,484
	Denmark	570	1,101	Germany	802	1,908
	USA	442	1,008	Netherlands	510	1,053
	Germany	396	753	USA	88	269
Grand Total		26,865	68,581		25,060	72,067

Source: Official Trade data from the State Institute of Statistics (SIS).

Table 5: Turkey's Seed Exports

Type of Seeds	Total & Country 2004	Quantity 2004 (MT)	Value 2004 (USD 1000)	Total & Country 2005 (Jan-Sep)	Quantity 2005 (Jan-Sep) (MT)	Value 2005 (Jan-Sep) (USD 1000)
Wheat	Total	31	13	Total	49	24
	Azerbaijan	15	5	Macedonia	39	18
Barley	Total	10	9	Total	2	2
	Georgia	10	9	Germany	2	1
Corn	Total	9,901	15,457	Total	1,556	2,549
	Italy	5,339	8,254	Italy	768	1,198
	Germany	977	1,709	France	169	247
	Spain	677	1,075	Germany	136	253
	France	481	821	Greece	109	168
	Netherlands	286	471			
	Croatia	179	401			
Paddy rice	Total	1	1	Total	3	4
	Germany	1	1	Belgium	2	3
Potatoes	Total	80	8	Total	150	21
	Iraq	80	8	Iraq	150	21
Pulses	Total	117	121	Total	182	243
	Greece	22	20	Greece	140	168
	Spain	22	19	Germany	26	30
	Philippines	22	18			
	USA	14	19			
Soybeans	Total	189	126	Total	0	0
	Italy	189	126			
Sunflower	Total	3,198	8,735	Total	2,487	8,128
	Spain	832	1,545	Russia	801	2,723
	Russia	743	1,826	Ukraine	602	1,894
	Ukraine	509	1,399	France	366	1,259
	Hungary	301	939	Bulgaria	230	843
	Bulgaria	292	1,345	Spain	222	478
Cotton	Total	1,087	2,578	Total	1,771	4,441
	Greece	664	2,011	Greece	946	3,026
	Spain	206	415	Spain	277	682
Sugar beats	Total	24	9	Total	23	412
	Azerbaijan	24	9	Azerbaijan	23	412
Vegetables	Total	479	2,886	Total	35	2,534
	Netherlands	201	1,856	Netherlands	6	1,678
Fodder crops	Total	3,902	1,391	Total	499	418
	Italy	2,715	789	Northern Cyp	216	253
	Northern Cyp	842	324	United King.	154	66
Grand Total		19,018	31,334		6,757	18,776

Source: Official Trade data from the State Institute of Statistics (SIS).

3.1.5. Tariffs⁴⁰

The GOT publishes official tariff levels for seeds every year, which is provided in Table 6. However, the Ministry of Agriculture has had the right to suspend import duties for most varieties since 1993. The only exception is for flower and ornamental seeds imported for commercial purposes. The same seeds for propagation are also being imported with zero duty. There is no change in the published tariffs in 2005 compared to those in 2004. Table 6 presents officially published but not applied duty rates for imports of various seeds. Seed imports are restricted to those companies that produce, procure, and market seeds domestically. Farmers Union, Central Union of Agricultural Credit Cooperatives, and related Agricultural Sales Cooperatives are also eligible to import seeds. Importers must have an

⁴⁰ <http://www.fas.usda.gov/gainfiles/200511/146131648.pdf>

import license from the Ministry of Agriculture to import seeds. Before being imported, seeds must be grown locally on trial plots and approved by the Ministry of Agriculture.

Table 6: Seed Import Duties as in the 2005 Import Regime

Type of Seed	EU & EFTA Countries (%)	Other Countries (%)
All Cereal (Except paddy rice)	0	0
Paddy rice	10	12
Sunflower	0	0
Soybean	0	0
Peanut	20	20
Rapeseed	0	0
All other oil seeds, inc. cotton, sesame, safflower, palm, and mustard	4	4
Flax fiber	0	0
Hemp fiber	4	4
Tea	4	4
Sugar beets	2.4	3.9
Flower	4	6
Forest tree	4	6
Fruit tree	4	6
All other planting seeds (1209), including vegetables and fodder crops	17.3	19.3

Source: The Official Gazette dated December 31, 2003

3.2. Survey of the registered and protected plant varieties in Turkey⁴¹

The approach of Turkey to modern biotechnology practices is supportive as a part of its general policy on transfer and development of technology. However she wants to ensure the safety of both technology itself and its products in terms of introduction into the environment and use in consumption purposes. As stated in the report prepared by SPO (State Planning Organization), agricultural biotechnology has the highest priority among the subjects considered for the research and development purposes. Within agricultural biotechnology plants has the highest priority. In this relation, Turkey had undertake quick survey of experts in the field of biosafety related areas. Over 60 expert name was received from 12 universities and 5 governmental institutions (Ministry of Agriculture and Rural Affairs, Ministry of

⁴¹<http://www.unep.ch/biosafety/development/countryreports/TRprojectrep0.pdf#search=%22Turkey%20%2B%20%22plant%20varieties%22%22>

Environment, Ministry of Forestry, Turkish Patent Institute, Turkish Council of Scientific and Technical Research) in the fields of administration, law, public information, risk assessment & management and socio-economics. Not all the experts were working directly in the field of modern biotechnology, but have expertise in the biosafety related issues such as pest management, toxicology, entomology, zoo technology, public health, soil microbiology, ethnobotany, plant and animal breeding as well as main disciplines of biology, agriculture, medicine, pharmacology and food sciences. Currently, four Universities have biotechnology department, others have biotechnology courses and post-graduate programs, most of them have working on agricultural biotechnology. Medical biotechnology (gene therapy), bioremediation, biodegradation and food processing technologies are the other fields of expertise in the Universities.

Main modern biotechnology programs have been run in the Universities, Agricultural Research Institutes and Turkish Council of Technical and Scientific Researches (TÜBİTAK) which has a research center working in all disciplines from plants to microorganisms. GDAR has also capacity to work on many different areas of agriculture. Main biotechnology works have been done on plants including field and horticultural crops. The works mainly concentrated on molecular characterization and gene mapping. There are a very few attempt to produce GMOs at present. But in the near future even private companies will start to work and produce GMOs that can be marketed. Before marketing any GMO should go through the procedure that is described in the legislation.

Ministry of Industry and Trade gave the support for consumer awareness soon after the distribution of printed notice of MOE. Ministry of Industry and Trade established sub-group under the Fourth Consumer Council for the matters related to consumption of GMOs and products thereof, having emphasis on their labeling issue. Consumer Rights Union organized a meeting to inform consumers on issues related to biotechnology.

Prime Ministry State Planning Organization established expertise commission on biotechnology and biosafety to include the issue in the eight five year development programme. The commission constituted representatives from governmental and non-governmental institutions, universities and private sector. The report of the commission determined the current status and needs with regard to biotechnology and biosafety in Turkey, and prepared strategic actions needed in this area for short and long-term implementation.

Ministry of Agriculture and Rural Affairs (MARA) established first field trials for cotton, potato and corn in 1998 in accordance to the directive for field trials of GM plants. The field trials including environmental risk assessment for these GMP varieties, except GM potato variety, were undertaken by the institutions in the same locations in 1999 and 2000. In order to determine possible risks of these GMP varieties on human and animal health, the analysis has been carried out by the university since the beginning of 2001.

Focal point and responsible agency of CBD is MOE and activities under Biosafety Protocol are co-coordinated by MOE. General Directorate of Agricultural Research (GDAR) has been serving as the Competent Authority for the Biosafety Protocol.

4. CONCLUSION

Turkey is agricultural country with insufficient use of the natural and human resources. The adoption of the DIS Program should be viewed as only the first phase of an agricultural reform process that fosters agricultural incomes and growth in a manner that is fiscally and economically sound and sustainable. A second phase is now needed that builds on the DIS Program by promoting agricultural productivity and boosting agricultural profitability through both investments in rural infrastructure, and in sustainable rural institutions that deliver critically needed services, including rural credit, marketing and processing, and technology transfers. Currently, DIS is, in effect, substituting for past distortive, inequitable, inefficient and non-sustainable agricultural policies. DIS transfers are as much a rural income support policy as a more efficient substitute for blunt agricultural policies. DIS needs to remain in place until Turkey formulates and initiates the implementation of an investment-based, regionally tailored rural development strategy focused on promoting greater productivity that restores agricultural profitability and income growth.

Though the DIS Program has been able to replace a large share of the loss in agricultural income lost as a result of the reform of agricultural subsidization, it is unpopular with a number of groups in the agricultural sector for two main reasons. First, the planned timing of DIS payments has not been clearly communicated to farmers, nor has a rationale for targeting particular regions earlier in the payment cycle been set out (though it has been partially formulated). These deficiencies are to be addressed in a Agriculture Framework Law in mid-

2004. In addition, DIS could be targeted to a greater degree on the poorest part of the farming community. This should be done by increasing the per hectare payments for the smaller half of farms (under five hectares) and substantially reducing the per hectare payments for cultivated farmland above the median farm size. However, the introduction of such adjustments to the DIS Program should take place only after the Program has reached a higher and steady level of beneficiaries and once a comprehensive rural development strategy has been formulated and initiated.

The rural development strategy should recognize the second source of the DIS Program's unpopularity: it does not (as it cannot directly) address the needs of commercial farming. So rather than being a substitute for other efficiency promoting instruments of agricultural policy, the DIS Program should be recognized by the Government of Turkey as a piece in an overall agricultural development strategy, which itself fits into the rural development strategy.

Since the last Regular Report, limited progress can be reported with respect to the alignment with the Common Agriculture Policy mechanisms. Turkey is therefore encouraged to continue with the legislative alignment process and to build up the necessary administrative capacity to implement new legislation fully. As indicated in the 2004 Regular Report, the main priority for Turkey in the short to medium term is to restructure and modernise the agricultural sector and to create alternative employment in rural areas. In this respect the initial moves Turkey has made on rural development are a welcome development. They remain limited however and progress in this area needs to be accelerated, particularly on the finalisation of a rural development strategy, the creation of a rural development plan, and the implementation of the Pre-accession Instrument for Rural Development (IPARD). The registration of farmers and cultivated land should be completed. In addition improvement and updating of agricultural statistics is recommended.

Turkey has continued to increase the level of alignment with the *acquis* in the area of the administration management. Administrative capacity has also improved, but remains insufficient. Effective enforcement of the legislation remains insufficient and gaps remain as regards the proper implementation of the legislation by non-specialised lower courts, and occasionally by specialised courts. The level of piracy remains particularly high. Coordination and cooperation between relevant bodies i.e. the Ministry of Justice and the judiciary, the police, the Ministry of Finance, the Under-secretariat for Customs and municipalities are

necessary but remain weak. Concerning in particular the judiciary, the application of provisional and precautionary measures and duration of court procedures remain insufficient.

Modern agricultural practices along with the establishment of the World Trade Organization (WTO), and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) including Plant Breeders' Rights (PBR), have brought significant changes in plant breeding, seed multiplication and trade. The availability of seed of improved varieties at a reasonable price is a prerequisite for any significant progress in agriculture. Therefore, Governments and the private sector must be motivated to invest in highly trained staff and allocate essential resources in the seed supply sector. This can only be achieved, if varieties are registered and intellectual property rights are protected through proper legislation that cover seed trade within and between countries⁴².

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