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A review and analysis of agricultural support policies in OECD countries (1995-2015)

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***Abstract*---**Supporting the agricultural sector is a topic that has been discussed for many years in the world and has been the governments' focus more than other economic sectors for many reasons, such as the nature of the agricultural sector, higher risk than other sectors, food security and nutrition and so on. Accordingly, the support of agricultural sector by different countries has varied depending on its importance in different countries of the world. The present study reviews and analyzes important policy changes, assessments, and recommendations in the context of the research in order to evaluate agricultural support policies in the member countries of the Organization for Economic Co-operation and Development (OECD), including Turkey, Korea and Japan. In this study, the latest agricultural policies in OECD countries are examined through measuring the parameters of agricultural support policies and using library studies. According to the studies, the OECD uses indicators such as Producer Support Estimate (PSE), Market Price Support (MPS), Producer Nominal Protection Coefficient (Producer NPC), Producer Nominal Assistance Coefficient (NACP), Consumer Support Estimate (CSE), General Services Support Estimate (GSSE), Total Support Estimate (TSE), and other related indicators to measure and classify the agricultural support based on a comprehensive system.

***Keywords*---**OECD, Supportive Policies, Agriculture, Comprehensive System, Consumer, Producer.

Introduction

The agricultural sector is important from various economic, social, and political aspects, and various countries in the world support this sector in many ways

(Baigonussova, Z. A., et. al., 2021; Athira, V. N., et al., 2020). Supporting the agricultural sector is considered as a sustainable and strategic policy in most advanced and developing countries. The main reasons for this are the low level of agricultural incomes and fluctuations compared to other economic sectors and the achievement of self-sufficiency in agricultural production to improve food security. In addition, supportive policies impose a heavy burden on governments, so targeting these costs is important.

A prominent example of the broad agricultural policies and the ways of supporting industrialized and advanced countries can be seen in the framework of the Organization for Economic Co-operation and Development (OECD). Supporting the agricultural sector in different countries of the world is carried out using various tools, mainly to achieve goals such as increasing incomes of farmers, supporting domestic producers and removing dependency, maintaining jobs, and reducing poverty. Comparison of levels of support in the agricultural sector in different countries of the world shows that despite differences in the type and extent of the policies, most countries apply a high level of protection, which is particularly visible in the common agricultural policy of the European Union and the new agricultural policy of the United States. The main support policies in the common agricultural policy of the European Union include price policies, indirect income payments (interest rates, production inputs, and tax reduction), direct payments of income (compensation for natural damage) and other government expenditures for research, advertising, and marketing. According to the new American agrarian law and other agricultural programs, support is provided through subsidies for agricultural loans, resource conservation, price support, product insurance, and export subsidies.

Generally, support in developing countries has tended more towards producer and consumer inputs and in developed countries towards price support from agricultural producers. About three-fourths of the total agricultural sector support in the OECD countries is for producers, and two-thirds of it is for price support. Indicators for the supportive policy assessment have been introduced to measure and compare the level of support in the agricultural sector. The most important indicators include of the Aggregate Measurement of Support (AMS), Producer Support Estimate (PSE), Consumer Support Estimate (CSE), and General Services Support Estimate (GSSE). The AMS index is calculated according to the rules of the World Trade Organization (WTO) and is used to determine the obligations of the member countries. The PSE, CSE, GSSE indicators are also calculated by the OECD experts for the OECD member countries; they are more complete than AMS and include all supportive policies. The PSE in the OECD member countries in 2001 was 31% of the value of agricultural production. Unlike the CSE which is negative and represents taxes, the GSSE accounts for about 17% of total agricultural support in these countries. The OECD member countries have begun to harmonize the methodology for calculating supports since 1987. This study compares the support and the top solutions of the OECD member countries using their indicators. The research problem for this study is to determine the common goals and policies among the OECD member countries.

Research Methodology

The latest agricultural policies in OECD countries are examined through measuring the parameters of agricultural support policies and using library studies.

Research Hypotheses

1. Agricultural support policies in the OECD countries have declined in the long run.
2. The supportive policies applied in OECD countries are in line with the environmental challenges ahead of humanity.

Indicators for Calculating Agricultural Support in OECD Countries

Several years ago, OECD countries began to harmonize the method of calculating support for the same inference from supportive concepts. Thus, some of these indicators are briefly stated as follows:
1. Producer Support Estimate (PSE): An indicator measuring the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers (regardless of their nature, objective, and impacts on production and income at the farm-gate level), which includes the following 8 components:
1.1. Market Price Support (MPS): an indicator measuring the gross annual monetary value of government supportive policies. These policies create a gap between domestic market prices and border prices of a specific agricultural commodity, which will keep domestic prices higher than border prices. In order to calculate the market price support, the price gap is multiplied by the amount of production and the market price gap of the products is also derived from the difference between the reference prices and the domestic price (guaranteed price); if the result is positive, it will represent the price support of the producers and if the result is negative, it will represent lack of price support of the producers.
1.2. Payments based on output: an indicator that measures the gross annual value of all payments based on the current output of a specific agricultural commodity or a specific group of agricultural commodities. The measure includes payment per ton, per hectare reanimate current production.
1.3. Payments based on area planted/ animal numbers: an indicator that measures the gross annual value of all payments based on the current plantings or number of animals in respect of a specific agricultural commodity or a specific group of agricultural commodities. The measure includes payment per hectare or per head to current area planted or animal numbers.
1.4. Payments based on historical entitlements: an indicator that measures the gross annual value of all payments based on historical support, area, animal numbers or production of a specific agricultural commodity or a specific group of agricultural commodities. The measure includes payment based on historical plantings/ animal numbers or production of such commodities and payments based on historical support programs for such commodities.
1.5. Payments based on input use: an indicator that measures the gross annual value of all payments based on the use of a specific fixed or variable input, or a specific group of inputs or factors of production. These payments, which are based on the farm-use payment, include explicit and implicit payments affecting

specific variable input costs, the cost of on-farm technical, sanitary, and phytosanitary services, or affecting specific fixed input costs, including investment costs.
1.6. Payments based on input constraints: an indicator that measures the gross annual value of all payments based on constraints on the use of a specific fixed or variable input, or a specific group of inputs, through constraining the choice of production techniques.
1.7. Payments based on overall farming income: an indicator that measures the gross annual value of all payments based on overall farming income without constraints to produce specific commodities, or to use specific fixed or variable inputs. These payments compensate for farm income fluctuations or losses, or for guaranteeing a minimum income of an agricultural enterprise or institution.
1.8. Miscellaneous payments: an indicator that measures the gross annual value of all payments to producers that cannot be disaggregated due, for example, to a lack of information.
In addition, to allow comparisons of these indices between countries and commodities, the PSE is calculated as a percentage, which actually represents the amount of producer support based on the percentage of gross farm income.
2. Market Price Support (MPS):an indicator measuring the gross annual monetary value of government supportive policies(transfers to farmers).These policies create a gap between domestic market prices and border prices of a specific agricultural commodity, which will keep domestic prices higher than border prices, measured at the farm-gate level.
3. Producer Nominal Protection Coefficient (NPCp):an indicator measuring the ratio between the average price received by producers (at farm gate), including payments per ton of current output, and the border price (measured at farm gate level).A value equal to one indicates the price received by farmers is equal to the border price of the product. A value greater than one indicates the price received by farmers is higher than the border price.
4. Producer Nominal Assistance Coefficient (NACp): an indicator measuring the ratio between the value of gross farm receipts including support and gross farm receipts valued at world market prices without support. A value equal to one indicates gross farm income has not been obtained without support or support has played no role in generating agricultural income for producers. A value greater one indicates the market share in agricultural income is lower and support is more important.
5. Consumer Support Estimate (CSE): an indicator of the annual monetary value of gross transfers to consumers of agricultural commodities, measured at the farm gate level, regardless of their nature, objectives or impacts on consumption of farm. A negative value indicates the imposition of implicit tax on consumer. For example, the value equal to -60% indicates not only the consumer has not been supported, but also a 60 percent tax on consumer spending on overall agricultural commodities has been imposed on consumers, which is transferred to producers as gross income.
6. General Services Support Estimate (GSSE): an indicator of the annual monetary value of gross transfers of general services provided to agriculture. When the GSSE is expressed as a percentage of total support estimates, the GSSE percentage represents the importance of public service support from the total support of the agricultural sector. Public service support includes the following components:

- ✓ Research and development (R & D)
- ✓ Agriculture schools
- ✓ Inspection services
- ✓ Infrastructure
- ✓ Marketing
- ✓ Market promotion
- ✓ Public storage
- ✓ Miscellaneous

7. Total Support Estimate (TSE): an indicator of the annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of the associated budgetary receipts. In other words, the TSE includes all transfers to the agricultural sector.

Assessment of Agricultural Support Policies in Selected Countries

1. Turkey

Support for agriculture: The level of support has changed from year to year, in spite of a series of ideological and far-sighted reforms after the late 1990s, and remains above the OECD average. The most distorted forms of support, which the most common oneis market price support, include three-quarters of the producer's support (Chart 1).

The Total Support Estimate (TSE) is estimated at almost 2% of the Gross domestic product (GDP) in most recent years. The payment based on production or consumption of inputs is the most important part of the support. One of the main sources of the GSSE is the financing of development and maintenance of infrastructure, accounting for nearly 80% of GSSE expenditure.

The price deviations have only slightly decreased. On average, domestic prices are 20% higher than global prices. Separate direct payments became obsolete in 2009, after which payments based on product production increased. The main and important tool for direct payments to farmers in Turkey is the payment of a deficit (reward payment) that is in the hands of producers who have less internal supply.

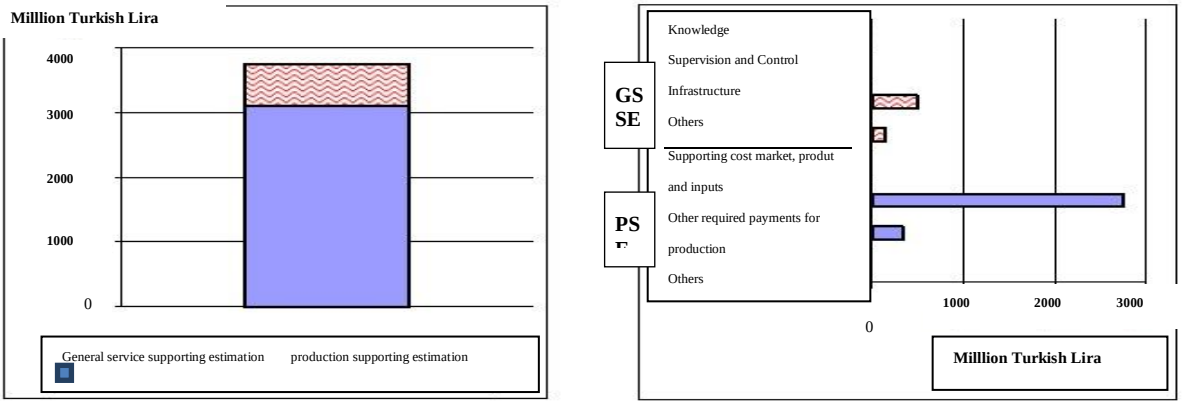

Chart 1: Total Support Estimate and its Components over the Period 2013-2015 (OECD, 2016)

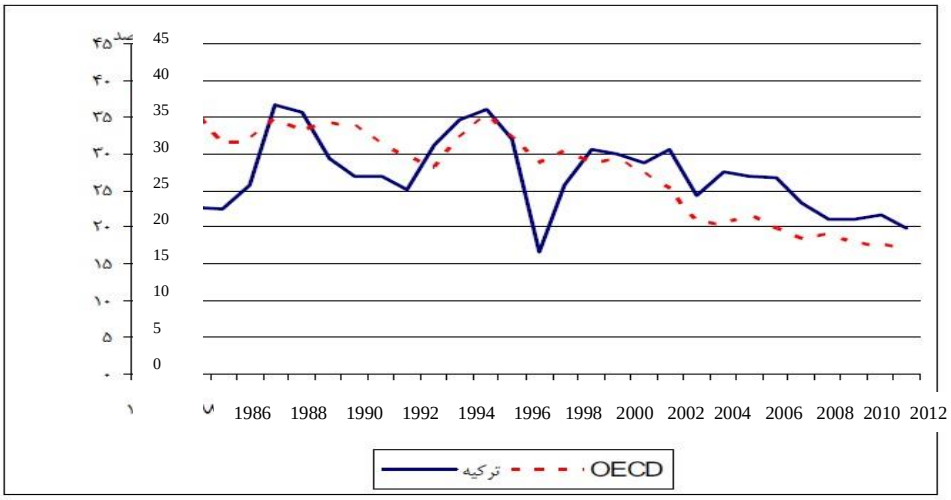

Chart 2:Producer Support Estimate as a Percentage of Gross Farm Receipts (% PSE) in Turkey and OECD over the Period 1986-2015

Important Policy Changes: according to the strategic agricultural policy objectives outlined in the 19th development plan (2014-2018), the development of a competitive and environmentally friendly agricultural sector globally aims to provide balanced and sufficient food for the population. After the cancellation of direct payments in 2009, the payment of a specific product deficit and payments based on based on area planted or animal numbers are the main program for the producer support.

Recently, Turkey, with the prevalence of modifications in deficit payments, has distinguished products that are eligible to pay because of justifying the production structure based on the most appropriate ecological conditions.

Assessments and Recommendations

- Turkey has made significant progress over the last decade towards strengthening the legal and institutional framework of the agricultural sector.
- Turkey's policy efforts have been aimed at improving market orientation since the period1986-1988. In this country, unique changes have been made to policy adjustments in the context of macroeconomic conditions with high inflation and exchange rate volatility.

The contribution of producer support to gross farm receipts (%PSE) remained about 20% over the periods from 2013 to 2015 and from 1986 to 1988, which is slightly higher than the OECD average.

- Producer support is largely due to the most distorted market practices that prevent sustainability in agricultural productivity. More efforts are needed to reduce the most disruptive support.

- More efforts are needed to turn government economic institutions into institutions with the economic profitability required to operate under competitive market conditions.
- More government funding is needed for the knowledge and innovation system of agriculture, which has so far received very little total support.

Table 1
Agricultural Support Estimate in Turkey (Million Turkish Liras) (OECD, 2016)

Definition	1986-88	1995-97	2013-15	2013	2014	2015
Total production value (at farm gate)	--	2440	140448	130446	140078	150823
Share of MPS products (percentages)	56.5	74.9	74.6	75.3	75.3	73.2
Total consumption value (at farm gate)	15	2227	109404	99385	111291	117291
Producer Support Estimate (PSE)	4	757	30868	28964	32138	31501
Support based on product production	3	564	25965	24172	27466	26259
Market Price Support	3	555	23237	21532	24715	23463
Payments based on production	0	10	2729	2640	2751	2796
Support based on input use	1	189	1529	1655	1348	1574
Based on variable input use	1	182	1207	1299	1071	1251
With input constraints	0	0	0	0	0	0
Based on fixed capital formation	0	6	296	333	254	301
With input constraints	0	0	0	0	0	0
Based on on-farm services	0	1	22	22	23	22
With input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	4	3377	3137	3324	3668
Based on	0	0	392	290	357	529

Receipts/ incomes						
Payments based on area planted/ animal numbers	0	4	2984	2847	2967	3139
With input constraints	0	0	57	37	53	81
Payments based on non-current A/An/R/I, production required	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0	0
With variable payment rates	0	0	0	0	0	0
With commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	0	0	0	0	0
With commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0	0
Based on non-commodity output	0	0	0	0	0	0
Based on other non- commodity criteria	0	0	0	0	0	0
Definition	1986-88	1995-97	2013-15	2013	2014	2015
Miscellaneous payments	0	0	0	0	0	0
Percentage of PSE	21.9	27.8	20.9	21.0	21.8	19.8
NPC Manufacturer (Coefficient)	1.25	1.30	1.20	1.21	1.21	1.19
NAC Manufacturer (Coefficient)	1.28	1.39	1.26	1.27	1.28	1.25
General Services Support Estimate	0	278	6582	6141	6351	7255

(GSSE)						
Agricultural Knowledge and Innovation System	0	4	77	82	73	76
Inspection and control	0	7	111	105	116	111
Development and maintenance of infrastructure	0	58	4924	4582	5133	5056
Marketing and market development	0	202	1471	1371	1029	2012
Government storage fee	0	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0
Percentage of GSSE (% TSE)	6.9	26.3	17.6	17.5	16.5	18.7
Consumer Support Estimate (CSE)	-3	-543	-15261	-15285	-15423	-15076
Transfers to producers from consumers	-3	-543	-16137	-16147	-16249	-16103
Other transfers from consumers	0	-29	-170	-93	-269	-147
Transfers to consumers from taxpayers	0	0	0	0	0	0
Excess feed cost	0	29	1045	955	1095	1084
Percentage of CSE (%)	-21.1	-23.6	-14.0	-15.4	-13.9	-12.8
Consumer NPC (coefficient)	1.29	1.33	1.18	1.20	1.17	1.16
Consumer NAC (Coefficient)	1.27	1.31	1.16	1.18	1.16	1.15
Total Support Estimate (TSE)	5	1035	37450	35105	38489	38756
Transfers from consumers	3	572	16306	16240	16519	16160
Transfers from taxpayers	1	492	21313	18957	22240	22743
Budget revenues	0	-29	-170	-93	-269	-147
Percentage of TSE (%GDP)	4.0	4.5	1.2	2.2	2.2	2.0
(Moderating GDP (1986-88=100)	100	13840	542461	501336	543109	582939

2. Korea

Agricultural Support: Korea has gradually reduced the support of the agricultural sector, especially in recent decades, and has had very slight progress toward highly market-oriented policies. However, producer support as a percentage of gross farm receipts (%PSE) is still almost three times higher than the OECD average. Korea after Switzerland, Norway, and Iceland has the highest percentage of PSE. The TSE as a percentage of the GDP declined significantly from 8.8% in 1986-1988 to 1.8% in 2013-15. Transfers to distinct farmers represent 86.1% of the TSE, and These accounts for 13.7% of the TSE.
Expenses for the development and maintenance of infrastructure are 46.5 percent of the GSSE, and after that, spending on the knowledge and innovation system is in the next rank.
Market Price Support (MPS) is an important component of the PSE in Korea, but the producer price ratio to the border price decreased from 3.35 in 1986-88 to 18.88 to 1.87 in 2015. By abandoning the government's rice procurement plan in 2005, when the government paid a higher price than the market price, Korea launched a state-owned stock-holding scheme, which is the mechanism of buying and releasing rice based on the current market price, and was completed with the rice reimbursement program. This policy change increased direct payments to farmers.

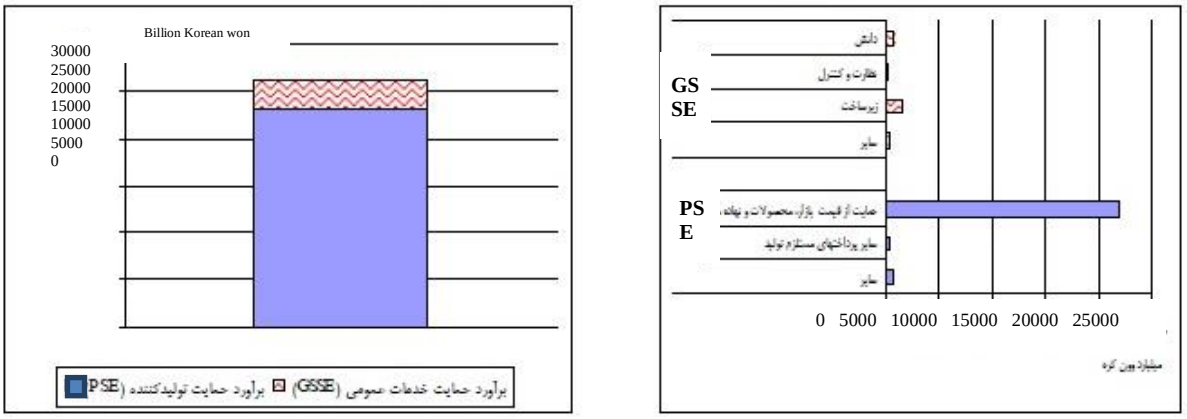

Chart 3: Total Support Estimate and its Components over the Period2013-2015 (OECD, 2016)

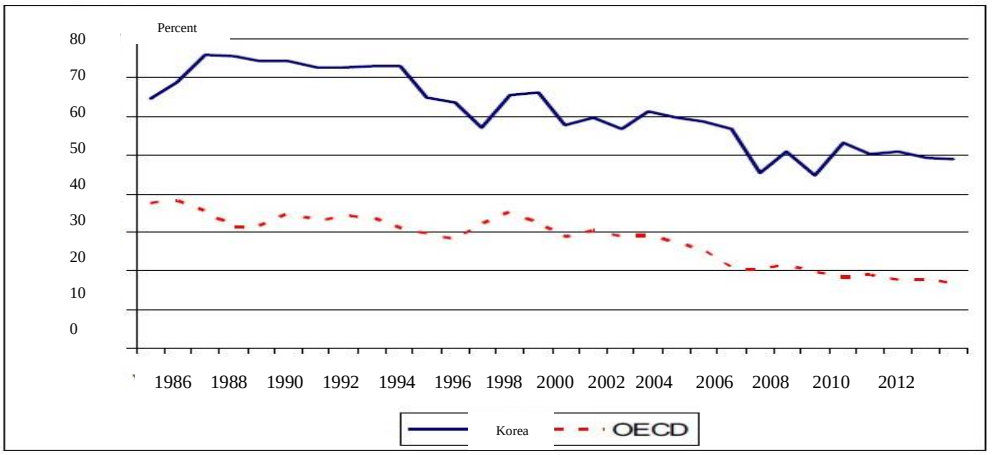

Chart 4: Producer Support Estimate as a Percentage of Gross Farm Receipts (% PSE) in Korea and OECD over the Period 1986-2015

Important policy changes: Rice tariffs in the Korean market have been implemented since January 1, 2015and past non-tariff measures have been replaced by rice tariffs. The rice import tariff rate was 513 percent, but the Minimum Market Access (MMA) was about 408700 tons at a tariff rate of 5 percent. In addition, the government announced a mid-term supply-demand balance for rice by gradually reducing production levels, encouraging product diversity, and increasing consumption by 2018. To increase innovation, Korea announced the development plan of the concept of smart farms: Greenhouses and cattle breeding farms can remotely be controlled by smart phones and personal subsidies, and the development of advanced agricultural production management models starts on the basis of large-scale statistical analysis.

Assessments and Recommendations

• Although the share of support through the budget payment plans has gradually increased in recent years using new payment plans and by rising rates of payments, market price support is still prevailing. More than 90% of the producer support is for special commodity and focuses on a limited number of products.
• Reforms of the rice production system should be a political priority, and the rice supply and demand balance plan is the first step in this direction.
• To improve market functioning and mitigate the effects of distortions, there is a need to change the direct payment plan based on production and price support towards targeted measures with explicit policy goals,which will meet community goals, such as providing environmental services including water management, flood control and biodiversity.
• Government investment for public services, in particular the Agricultural Knowledge and Innovation System, is relatively low compared to the OECD average. Further efforts are required to increase budget expenditures towards long-term growth and competitiveness in the sector.

Table 2
Agricultural Support Estimate in Korea (Million Korean Won)

Definition	1986-88	1995-97	2013-15	2013	2014	2015
Total production value (at farm gate)	13624	27747	44650	44609	44919	44421
Share of MPS products (percentages)	72.0	64.3	63.8	61.3	63.0	67.1
Total consumption value (at farm gate)	14367	30693	52968	52449	54040	52414
Producer Support Estimate (PSE)	6905	19277	23071	23523	22930	22760
Support based on product production	9511	18199	21312	21950	21313	20671
Market Price Support	9511	18199	21312	21950	21313	20671
Payments based on production	0	0	0	0	0	0
Support based on input use	70	871	594	547	554	683
Based on variable input use	23	136	214	233	205	202
With input constraints	3	11	68	76	64	64
Based on fixed capital formation	44	725	264	221	269	302
With input constraints	0	70	43	44	41	43
Based on on-farm services	3	10	117	92	80	179
With input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	24	206	362	300	264	521
Based on receipts/ incomes	24	196	244	251	219	263
Payments based on area planted/ animal numbers	0	11	117	49	45	259
With input constraints	0	0	53	49	45	65
Payments based on non-current A/An/R/I, production not required	0	0	803	726	798	884
With variable payment rates	0	0	0	0	0	0
With commodity exceptions	0	0	0	0	0	0
With fixed payment rates	0	0	803	726	798	884
With commodity exceptions	0	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0	0
Based on non- commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0

Miscellaneous payments	0	0	0	0	0	0
Percentage of PSE	69.7	67.1	49.7	50.9	49.3	48.9
NPC Manufacturer (Coefficient)	3.35	2.97	1.91	1.97	1.90	1.87
NAC Manufacturer (Coefficient)	3.83	3.09	1.99	2.04	1.97	1.96
General Services Support Estimate (GSSE)	842	2852	3120	2314	2903	3144
Agricultural Knowledge and Innovation System	54	315	799	865	735	799
Inspection and control	21	63	207	196	195	229
Development and maintenance of infrastructure	374	2121	1708	1682	1689	1754
Marketing and market development	0	12	57	65	69	37
Government storage fee	394	341	349	505	216	325
Miscellaneous	0	0	0	0	0	0
Percentage of GSSE (% TSE)	7.9	12.7	11.9	12.3	11.2	12.1
Consumer Support Estimate (CSE)	-9425	-19748	-24268	-24944	-24304	-23557
Transfers to producers from consumers	-9304	-17861	-20625	-21228	-20705	-19942
Other transfers from consumers	-181	-2148	-3686	-3764	-3640	-3655
Transfers to consumers from taxpayers	59	260	43	48	41	40
Excess feed cost	0	0	0	0	0	0
Percentage of CSE (%)	-65.7	-64.8	-45.9	-47.6	-45.0	-45.0
Consumer NPC (coefficient)	2.94	2.91	1.85	1.91	1.82	1.82
Consumer NAC (Coefficient)	10507	22390	26234	26884	25874	25943
Total Support Estimate (TSE)	9484	20009	24311	24992	24345	23597
Transfers from consumers	-181	-2148	-3686	-3764	-3640	-3655
Transfers from taxpayers	8.8	4.9	1.8	1.9	1.7	1.7
Budget revenues	100	187	275	273	274	280
Percentage of TSE (%GDP)	13624	27747	44650	44609	44919	44421
(moderating GDP (1986-88=100)	72.0	64.3	63.8	61.3	63.0	67.1

3. Japan
Agricultural Support

Japan has gradually reduced support for agriculture, but this is relatively modest. Support is still high and on average, 48 percent of gross agricultural income is estimated to be over the period of2013-2015, which is almost three times the OECD average. Market Price Support (MPS) continues to be a key component of

producer support and is protected through trade barriers, especially for rice. The TSE is about 1% of gross domestic product in recent years, which is mainly allocated to the Producer Support Estimate (PSE). Less than one-sixth of the total support is allocated to the GSSE for the agricultural sector. About 80% of the GSSE is concerned with payments of the development and maintenance of infrastructures.

Chart 5: Total Support Estimate and its Components in Japanover the Period2013-2015

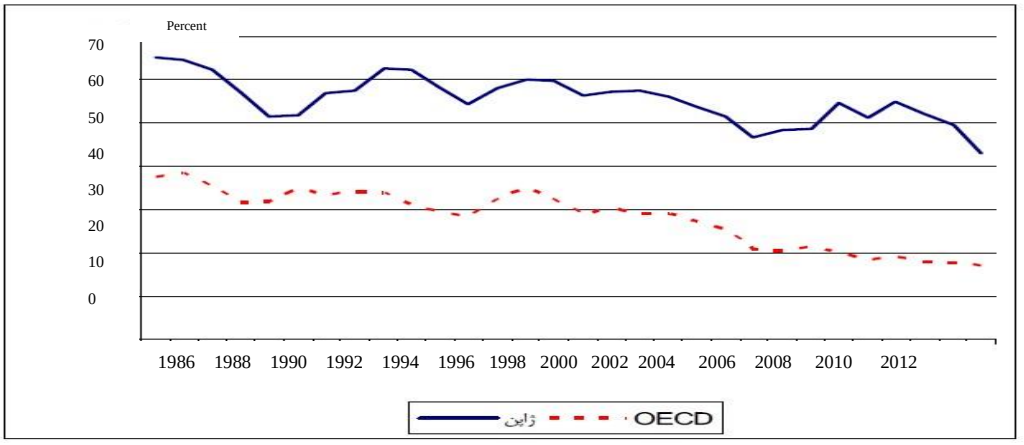

Chart 6: Producer Support Estimate as a Percentage of Gross Farm Receipts (% PSE) in Japan and OECD over the Period 1986-2015

Important policy changes: Japan has adopted a new groundbreaking program for food and rural areas in 2015, which will outline the strategic objectives and plans for the next 10 years. The program sets the goals for food self-sufficiency in 2025 based on the supply of calories (45%) and production value (73%). At present, these numbers are above 39% and 64%, respectively. The development of the

economic potential of agriculture and food supply is the focus of this program and emphasizes the encouragement of exports, innovation and conservation of agricultural land. It also aims to establish a voluntary scheme in which farmers and the government work together to create a better balance between rice supply and demand. Thus, the current rice supply management system can be replaced by this program.

The payment of income support based on the area planted for mountain products, introduced in 2007, was revised based on the area planted in 2015.However, previous payments were made since the area planted before 2014. Japan and 11 countries that border the Pacific Ocean signed up to the Trans-Pacific Partnership (TPP) in the late 2015. According to the agreement, access to the market for agricultural products, including rice, pork, dairy, beef, wheat and sugar, will be improved.

Assessments and Recommendations

•Japan started implementing policy reforms based on the Agricultural Reform Program of 2013. These reforms provide a mixed image. While the end of the administrative allocation of rice production until the 2018 crop year is an important step towards giving more freedom to farmers in response to market signals, there are incentives to produce deviant products, such as rice for animal feed and factory production through special commodity payments, and rice price will remain high. Further efforts are needed to gradually reduce these measures, the gap between domestic and international rice prices, and production costs by facilitating farm size growth.

• Japan has committed itself to reducing the border measures of some commodities under the TPP framework. Once implemented, this will be a move toward more market orientation, and it will be able to strengthen the competitiveness of this sector. However, Japan has proposed various domestic measures to mitigate the adverse effects of the TPP on domestic producers, including a revision of the income stabilization program for livestock producers and purchasing rice for storage. These measures should be temporary and should be used to promote more structural changes and increase the productivity of this sector.

• Japan has made significant efforts to promote the integration of business farmers 'agricultural land approved by the authorities. The establishment of an agricultural land bank, various types of support for eligible business farms and paying young farmers can play a role in restructuring and productivity growth; however, there are other factors preventing the growth of efficient farms. Land use regulations should be more transparent and formulated with a predictable framework for conversion of farmland to non-agricultural uses. The tax on unused land should be reduced to encourage the productive use.

• The current Japanese agricultural innovation system is characterized by a traditional top-down approach, in which public sector scientists introduce new technologies that are transferred to farmers through promotion agents. The agricultural innovation system needs to be evolved to meet the needs of business farmers based on a more comprehensive and interactive approach, including reforms of government financing of research and development spending, promotion services, and agricultural education.

Table 3
Agricultural Support Estimate in Japan (Million Japanese yen)

Definition	1986-88	1995-97	2013-15	2013	2014	2015
Total production value (at farm gate)	10610	10128	8428	8467	8364	8452
Share of MPS products (percentages)	68.4	67.9	66.0	66.4	65.4	66.3
Total consumption value (at farm gate)	14298	15070	12200	12185	12734	11682
Producer Support Estimate (PSE)	7267	6239	4520	4902	4603	4055
Support based on product production	6740	5822	3761	4156	3854	3274
Market Price Support	6519	5651	3578	3973	3669	3092
Payments based on production	221	171	183	182	185	181
Support based on input use	299	298	150	156	164	131
Based on variable input use	149	124	51	51	51	51
With input constraints	0	0	0	0	0	0
Based on fixed capital formation	129	153	68	74	81	49
With input constraints	0	0	0	0	0	0
Based on on-farm services	21	21	31	31	31	30
With input constraints	0	0	0	0	0	0
Payments based on current A/An/R/I, production required	0	0	252	238	204	314
Based on Receipts/ incomes	0	0	76	72	75	80
Payments based on area planted/ animal numbers	0	0	176	166	129	234
With input constraints	0	0	42	8	8	111
Payments based on non-current A/An/R/I, production required	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	228	119	356	352	381	336
With variable payment rates	0	0	0	0	0	0
With commodity exceptions	0	0	0	0	0	0
With fixed payment rates	228	119	356	352	381	336
With commodity exceptions	228	119	258	216	250	308
Payments based on non-commodity criteria	0	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0	0
Based on non-commodity output	0	0	0	0	0	0

Based on other non-commodity criteria	0	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0	0
Percentage of PSE	64.0	58.1	48.2	52.2	49.5	43.1
NPC Manufacturer (Coefficient)	2.65	2.31	1.79	1.93	1.82	1.61
NAC Manufacturer (Coefficient)	2.78	2.40	1.94	2.09	1.98	1.76
General Services Support Estimate (GSSE)	1266	2054	894	964	903	815
Agricultural Knowledge and Innovation System	75	95	115	125	114	106
Inspection and control	8	10	11	12	11	11
Development and maintenance of infrastructure	1118	1858	746	807	756	675
Marketing and market development	22	27	7	6	7	7
Government storage fee	43	63	15	15	15	16
Miscellaneous	0	0	0	0	0	0
Percentage of GSSE (% TSE)	14.9	24.7	16.5	16.4	16.4	16.7
Consumer Support Estimate (CSE)	-8910	-8080	-4932	-5232	-5068	-4496
Transfers to producers from consumers	-6423	-5603	-3579	-3972	-3670	-3094
Other transfers from consumers	-2483	-2503	-1358	-1265	-1403	-1406
Transfers to consumers from taxpayers	-16	26	1	1	1	1
Excess feed cost	11	0	4	5	4	3
Percentage of CSE (%)	-62.3	-53.6	-40.4	-42.9	-39.8	-38.5
Consumer NPC (coefficient)	2.66	2.17	1.68	1.75	1.66	1.63
Consumer NAC (Coefficient)	2.65	2.16	1.68	1.75	1.66	1.63
Total Support Estimate (TSE)	8518	8318	5415	5867	5507	4871
Transfers from consumers	8906	8106	4937	5237	5073	4500
Transfers from taxpayers	2095	2715	1836	1894	1837	1777
Budget revenues	-2483	-2503	-1358	-1265	-1403	-1406
Percentage of TSE (%GDP)	2.3	1.6	1.1	1.2	1.1	1.0
(moderating GDP (1986-88=100)	100	109	92	90	92	94

Agricultural Support: In the United States, total agricultural support represents 0.5 percent of the GDP over the period 2013-2015. The GSSE represents 11% of the TSE over the period 2013-2015. Producer support as a percentage of gross farm receipts is around half the OECD average.

The share of production-based payments and input-based payments for the PSE is still high and accounts for 49% of the PSE (OECD average is 60%). However,

38% of input-based payments in the United States are subject to voluntary environmental constraints. Payments requiring production based on area planted/ animal numbers / receipts / incomes account for 20% of the PSE. These payments relate primarily to agricultural insurance and are paid based on the difference between the observed production, yield or income, and a reference before planting on a single farm or at the area level. Approximately half of total support estimate is related to consumer protection provided through the Supplemental Nutrition Assistance Programmed (SNAP) with the imposition of tax on taxpayers.

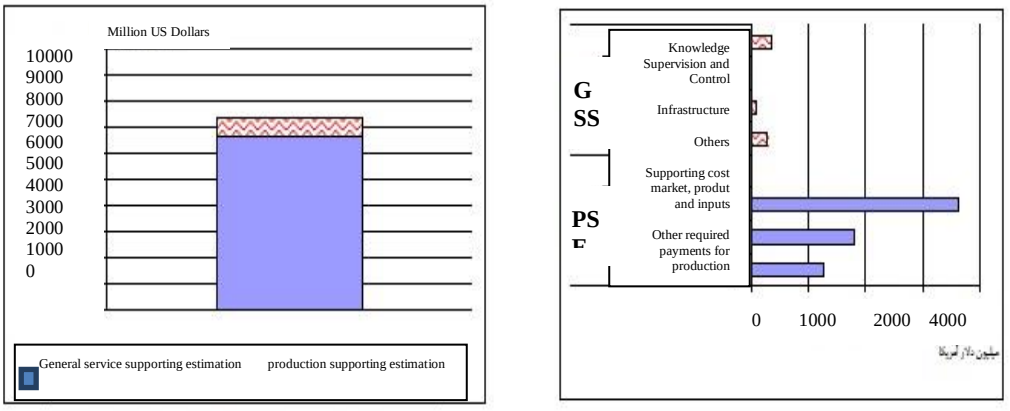

Chart 7: Total Support Estimate and its Components in the United States over the Period2013-2015 (OECD, 2016)

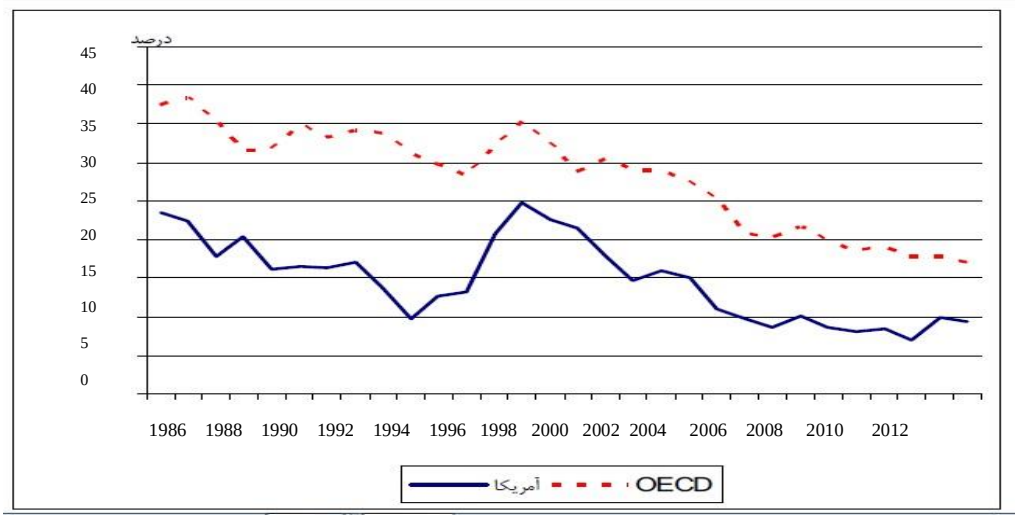

Chart 8:Producer Support Estimate as a Percentage of Gross Farm Receipts (% PSE) in the United States and OECD over the Period 1986-2015

Important policy changes: With the implementation of the Agricultural Act of 2014, which is now in progress, the country's domestic policy developments have been limited in the calendar year 2015. There have been some developments that

are related to the implementation of the Agricultural Act, in particular the development of programs in 2015. However, most of the actions started in 2014 and remained unchanged in 2015. Some important developments have occurred in the area of preferential and regional trade agreements. For example, the Trade Preferences Extension Act of 2015 (TPEA)provides a preferential customs duty exemption for a wide range of products imported from countries and the African territories. The United States signed up to the Trans-Pacific Partnership (TPP) in October 2015, while continuing to negotiate with the European Union in the field of the Transatlantic Trade and Investment partnership (TTIP). Other developments relate to food labels and their safety. Finally, other innovative measures encourage new farmers or target the rural poverty.

Assessments and Recommendations

• Producer and border support levels have significantly decreased from 1966 to 1988. However, the decline in supportive levels after 2002 was primarily attributable to higher global commodity prices, so that several policies implemented are related to these price changes. In general, the average support over the period 2013-2015 represents 8.8% of the gross farm receipt, which is about 9.4% in 2015.
• Increasing emphasis on policy tools for risk management and insurance is, in principle, a desirable approach to providing support to farmers who need assistance. However, the policy tools included in the Agricultural Act of 2014 may transfer some of the normal hazards from farmers to public funding.
• Since environmental programs, such as the Environmental Quality Incentives Program (EQIP)and Agricultural Conservation Easement Program (ACEP), seem to be effective in addressing soil conservation and water pollution, precise evaluations are necessary to ensure that newer programs, such as the Regional Conservation Partnership Program (RCPP), are well targeted at addressing the desired environmental benefits at the local level.
• In general, long-term effects on agricultural productivity and efficiency resulting from the Agricultural Act of 2014 require a continuous evaluation.

Table 4
Agricultural Support Estimate in the United States (Million US dollars)

Definition	1986-88	1995-97	2013-15	2013	2014	2015
Total production value (at farm gate)	143469	200325	393982	394251	405217	382477
Share of MPS products (percentages)	78.3	76.5	79.2	78.8	79.4	79.3
Total consumption value (at farm gate)	121087	162235	304215	306185	318670	287791
Producer Support Estimate (PSE)	35337	25617	37126	29020	43572	38785
Support based on product production	15114	11487	9409	3404	13935	10888
Market Price Support	12003	11336	8983	3079	13390	10480
Payments based on	3111	151	426	325	545	408

production						
Support based on input use	7061	6641	8677	9238	8376	8416
Based on variable input use	3697	3088	2772	3413	2719	2183
With input constraints	739	264	594	587	606	588
Based on fixed capital formation	1233	554	1745	1958	1641	1636
With input constraints	1233	537	1697	1876	1602	1613
Based on on-farm services	2131	2999	4160	3867	4015	4598
With input constraints	349	543	1209	1188	1264	1176
Payments based on current A/An/R/I, production required	12231	1825	8325	9036	8022	7915
Based on Receipts/ incomes	912	721	1598	1269	1693	1833
Payments based on area planted/ animal numbers	11319	1104	6726	7767	6329	6082
With input constraints	2565	557	6611	7591	6209	6033
Payments based on non-current A/An/R/I, production required	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	338	3824	8653	4995	11312	9653
With variable payment rates	0	0	4936	0	5191	9618
With commodity exceptions	0	0	4936	0	5191	9618
With fixed payment rates	238	3824	3717	4995	6122	35
With commodity exceptions	0	3824	2923	4043	4726	0
Payments based on non- commodity criteria	592	1839	2062	2347	1927	1912
Based on long-term resource retirement	592	1839	2028	2283	1903	1897
Based on non-commodity output	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	34	64	24	16
Miscellaneous payments	0	0	0	0	0	0
Percentage of PSE	21.2	11.9	8.8	6.9	10.0	9.4

NPC Manufacturer (Coefficient)	1.12	1.06	1.02	1.01	1.04	1.03
NAC Manufacturer (Coefficient)	1.27	1.14	1.10	1.07	1.11	1.10
Definition	1986-88	1995-97	2013-15	2013	2014	2015
General Services Support Estimate (GSSE)	3108	4239	9012	10413	7889	8735
Agricultural Knowledge and Innovation System	1129	1479	2311	2299	2299	2335
Inspection and control	372	559	1328	1335	1328	1320
Development and maintenance of infrastructure	13	27	2958	4282	2017	2575
Marketing and market development	495	654	1189	1267	1020	1279
Government storage fee	0	52	1	4	-1	-1
Miscellaneous	1100	1468	1226	1226	1226	1227
Percentage of GSSE (% TSE)	6.4	8.9	10.4	11.8	8.0	11.4
Consumer Support Estimate (CSE)	-2629	6157	31628	45217	32359	17308
Transfers to producers from consumers	-11699	-11146	-875	-2970	-13019	-10284
Other transfers from consumers	-1314	-1143	-1090	-271	-1255	-1743
Transfers to consumers from taxpayers	10089	18437	41475	48459	46633	29334
Excess feed cost	294	8	0	0	0	0
Percentage of CSE (%)	-2.4	4.3	12.0	17.5	11.9	6.7
Consumer NPC (coefficient)	1.12	1.08	1.03	1.01	1.05	1.04
Consumer NAC (Coefficient)	1.03	0.96	0.89	0.85	0.89	0.94
Total Support Estimate (TSE)	48534	48292	87613	87892	98094	76854
Transfers from consumers	13013	12288	9847	3242	14274	12026
Transfers from taxpayers	36835	37147	78856	84922	85075	66570
Budget revenues	-1314	-1143	-1090	-271	-1255	-1743
Percentage of TSE (%GDP)	1.0	0.6	0.5	0.5	0.6	0.4
(moderating GDP (1986-88=100)	100	128	181	178	181	183

Conclusion

A review of agricultural supportive policies among OECD countries has shown that these important achievements can be realized in the short term:
Market price support should be reduced and ultimately eliminated. This tool is not well targeted, and the target group does not benefit from it. Consumers still pay for it. This is especially true in low-income countries. If countries intend to re-invest, the financial context must be available to do so. It has also isolated farmers from market developments and can severely distort production and trade. It is clear that the subsidy is not an effective way to help farmers, and a significant part of it is transferred outside the agricultural sector. The subsidies also increase the risk of excessive use and misuse of these valuable agricultural inputs, such as fertilizers, that can be harmful to the environment. The agricultural credit support scheme also imposes a large burden on government budgets. It has been pointed out that supporting variable inputs also distorts production and trade.

The design of income and profit stabilization measures should be carefully evaluated. These measures sometimes yield only few benefits in comparison to the high costs imposed on taxpayers. The extent of this is well seen at a time when the price of agricultural products is reduced or some of the products are systematically eliminated. Market penetration is one of the risks that crop producers face, and government support should focus more on helping farmers manage disastrous events. While policies can help develop these markets, it should be ensured that government support for market solutions and farmers' risk management activities do not crowd out.

Direct payments, if related to specific goals and stakeholders and are well designed and tailored to the problems, can be effective tools in specific policy areas, such as the achievement of environmental benefits and support for farmer's income. The coverage support of landowners has almost never been justified; however, direct payments can play an important temporary role in the reform process of agricultural policies.

Improving environmental empowerment is important for a business-centered agricultural sector. At the same time, concerns about the negative impacts of farming on the natural environment should be addressed through a combination of laws, taxation, and market-based solutions.

The OECD Secretariat during 2013 and 2014 and officials of member and non-member economies and a number of international experts developed a series of scenarios for the agricultural and food system by 2050, which is as follows:
In a highly interactive process involving two workshops and an online exchange platform, three alternative scenarios were formulated for global developments over the coming decades and its applications in market outcomes and key policy objectives were analyzed and major policy responses were discussed. These three scenarios were designed to provide dissenting views based on alternative assumptions, among other things, and the level of international cooperation and sustainability superiority in social mindsets. The analysis of these scenarios was supported through the quantification of key elements based on four global

economic models, including several key actors for analyzing long-term developments in agricultural markets.

While the OECD-FAO mid-term Outlook of 2015 predicts that crop prices will continue to decline in the coming decades, long-term scenarios suggest that this decline can be very slow or can have a reciprocal trend in the next 40 years and prices will rise. Thus, it has important implications for key policy goals in agriculture. If the growth of productivity and international cooperation allows adequate supply and neutralization of regional shocks, food security can be improved significantly. But in the current situation, this progress may be very limited. More focus on sustainability can reduce basic production (for example, by limiting development to areas with high biodiversity, or by restricting the use of harmful agricultural inputs); however, changing the diet away from the source of the rich animal protein can reduce the pressure on the system and improve the food security and possible health benefits. If the continuation of the transfer of production factors, such as labor from the agricultural sector to the service and production sectors, is controlled by some policies or rural areas in developing countries, worse outlooks will be imagined. The structural change can be facilitated through international cooperation, further innovation, technological progress, increased agricultural trade and regional reallocation.

There is no doubt that pristine forests and other valuable ecosystems will be under continuous pressure if more effort is not forthcoming, and that more biodiversity is expected to be eradicated. The same is true of greenhouse gas emissions from the agricultural sector. Greenhouse gas emissions from the agricultural sector can increase without any corrective actions. A more sustainable focus, for example, through maintaining biodiversity and changing diets, has the potential to significantly improve such developments. Risks associated with transboundary spreading of plant and animal diseases or food security risks can increase with increased international trade. The risks of food security increase for more international and complex, and longer supply chains. In addition, international cooperation in preventing, identifying, and controlling diseases or food security risks, along with greater biodiversity and diversity of agricultural production systems and fewer livestock, can be effective in reducing these pressures.

What can governments, societies and the international community do to improve these results? What are the key opportunities for different stakeholders? What are the main areas of cooperation needed? Two of the most important aspects for creating the difference are the increased international efforts to grow sustainable productivity and the flow of environmental and social traceability of feed for the consumer market decision-making process in the market. Growth in productivity and sustainable agriculture is beyond two opposite goals and is two sides of the same coin, emphasizing that the concept of productivity growth justifies the use of natural resources, and in particular shared resources. Developments related to OECD Indicators in green growth, such as the environmentally adjusted multifactor productivity, are of key importance in this regard. Some of the policies covered in this report, such as market price support or protection of fertilizers, are at the core of the risk of sustained productivity growth, because these supports distort the farmers' incentives. However, a favorable environment for

interdisciplinary research, developments and agricultural education can improve long-term outcomes.

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