

The greening of farm support programs: international experiences with agricultural subsidy reform



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Purpose

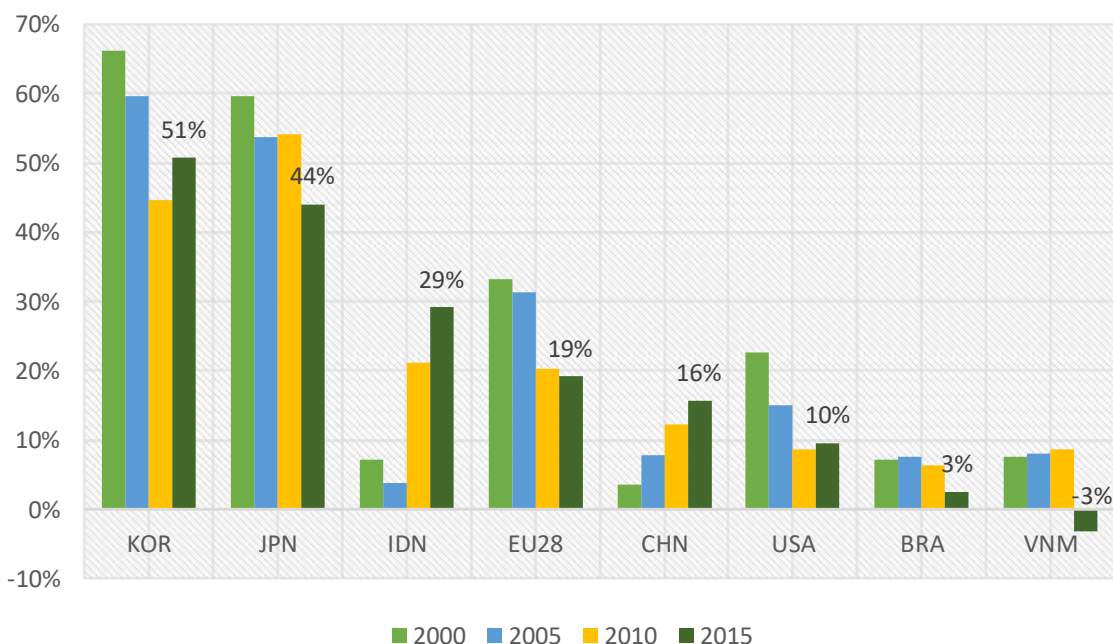
Indonesia is considering phasing out its fertilizer subsidy program due to concerns about its high fiscal cost, limited impact on agricultural productivity, and unintended adverse environmental impacts. Other countries have or are in the process of removing or scaling back input subsidies, while putting in place other support for sustainable agricultural intensification, and various forms of green and climate smart agriculture. This is a synthesis of several such experiences and the lessons for Indonesia as it proceeds with policy and public spending reforms.

Background and conceptual framework

Contemplating reform: challenges and opportunity cost of Indonesia's fertilizer subsidy program

Indonesia has a highly supported agricultural sector among OECD countries, and spending on agriculture has risen over the past decade (Figure 1). The premise for this work is that the Government of Indonesia is reconsidering how it directs some of that support to farmers. Specifically, it is considering how it might reorient its spending on fertilizer subsidies—which were the largest single agricultural spending item in 2017, at nearly USD 2.2 billion (IDR 31 trillion), or about 30 percent of agricultural spending (Indonesia MoF 2016, AIPEG 2017).

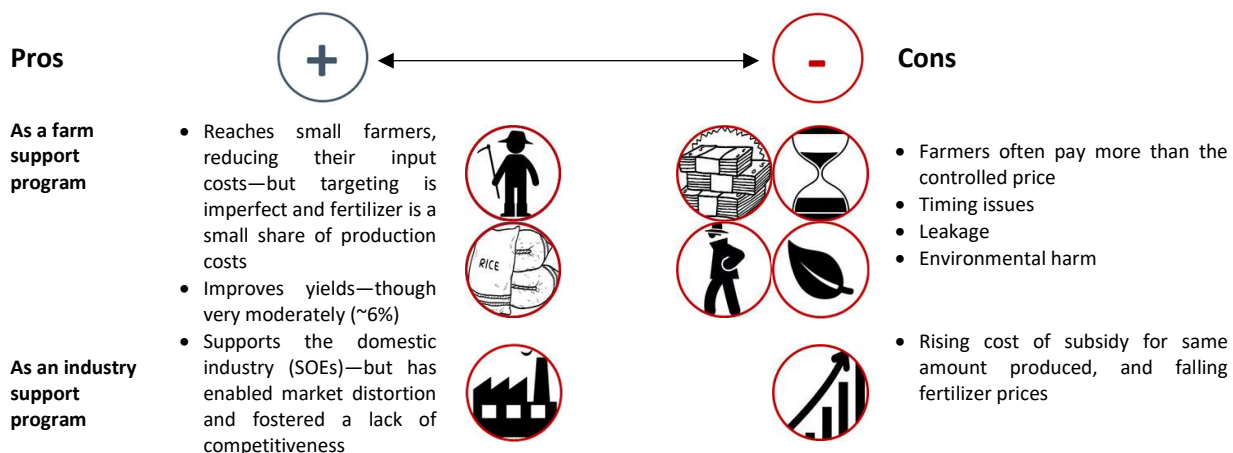
Figure 1: Producer support estimates in selected OECD countries, 2000–15



Source: Based on OECD 2017a data.

Indonesia's fertilizer subsidy program faces a range of challenges that raise the question of its opportunity cost, and how it could better meet its fundamental policy objectives—especially the objectives of supporting agricultural productivity, and the income of small farms. The following is a brief account of the fertilizer subsidy program's strengths and weaknesses (Figure 2).

Figure 2: Pros and cons of Indonesia's fertilizer subsidy



First, as a farm support program, it potentially reaches up to 38 million small farmers with under 2 hectares of land, keeps input costs low by controlling the price of fertilizer and enhances crop yields. But farmers often face price markups by final retailers and end up paying more than the controlled price—as high as 40 percent more—and fertilizer spending accounts for only roughly 6 percent of rice farmers’ production costs (World Bank 2016). This is justified by the low margins that the system builds in for retailers, as well as for shortages in the market, which result from demand misestimation issues, supply chain bottle necks, a lack of competition, and also, significant leakage problems. It is estimated that approximately 30 percent of the subsidy is diverted to ineligible farms (large farms, including oil palm plantations) and export markets (AIPEG 2017, citing an unpublished government ombudsman report from 2015). In addition, the subsidy encourages the excessive and inefficient use of fertilizer, which is a significant source of soil, water, air, and climate pollution. Furthermore, while it is thought to enhance yields, as noted, that effect is thought to be quite a moderate one—on the order of 6 percent or possibly much less (Osorio et al. 2011, AIPEG 2017). And the subsidy is imperfectly targeted, with roughly 40 percent of farmers receiving 60 percent of the benefit.

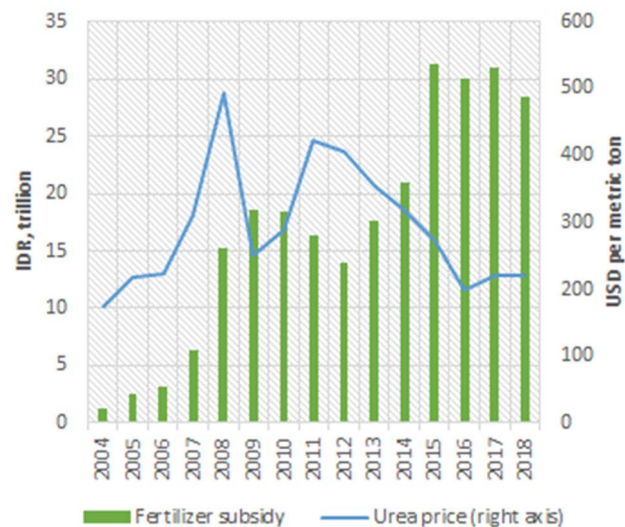
Second, as a fertilizer industry support program, the fertilizer subsidy can be credited with effectively supporting the existence of a domestic fertilizer industry. Indeed, the state-owned enterprises that manufacture fertilizer domestically (and have exclusive access to the subsidy) are not particularly competitive, suggesting their possible dependence on the subsidy program to subsist at their current level of activity. If anything, the subsidy program has seemingly contributed to industry concentration and distortion, and over the years, domestic manufacturers have reportedly become less efficient in their production and distribution operations—facing stagnant sales and rising costs. As a result, the subsidy program’s cost to the government has increased by 70 percent while production has remained flat—and the market price of fertilizer has declined (Figure 3). Meanwhile, economies of scale in domestic fertilizer production have already been realized—such that this is no longer a pertinent justification for industry support (based on AIPEG 2017).

More generally, a significant portion of central government spending in Indonesia is used to subsidize private inputs, such as fertilizer, rather than provide public goods. Agricultural spending on public goods besides irrigation—such as on agricultural innovation and risk management—has been below 5 percent (World Bank 2016).

Indonesia might learn from other countries' experiences greening their farm support programs

The above realities suggest that there are likely other ways in which over IDR 31 trillion (USD 2 billion) could be spent each year to benefit the farm sector and especially small farmers. In contemplating a reform of its fertilizer subsidy program (and perhaps others), Indonesia might draw on the experiences of other countries.

Figure 3: Indonesia fertilizer subsidies, and international urea prices, 2004–2018



Source: Osorio et al. 2011, Indonesia MoF 2016, Indonesia MoF 2018, World Bank 2018a and 2018b.

Note: Price of urea for 2018 is a forecast as of April 2018. Spending figures for 2017 and 2018 are government forecasts as of July 2018.

Many countries have overhauled their farm support programs or are in the process of doing so—often with greater sensitivity to the environment. This note looks at experiences of the Republic of Korea, China, Vietnam, the European Union (EU), the United States, and India reforming their farm support program, focusing on those reforms that have an environmental orientation.

There are many directions in which fertilizer subsidy funds could be redirected in Indonesia. The choice of focus on the greening of agricultural subsidy programs is based on the fact that many countries have recognized the opportunity to support food security and farmers, and farm sector competitiveness, while also ensuring the sector’s sustainability. They are doing this by supporting farmers’ provision of environmental public goods and taking measures to protect the environment including the natural capital on which agricultural production and food security so heavily depend. This opportunity should be of particular relevance to Indonesia, given its aims of supporting green and inclusive growth. Nonetheless (despite this focus), efforts to green agricultural subsidies are best understood in the context of broader agricultural policy reform.

The greening of farm support programs is best understood in the context of broader agricultural policy and subsidy reforms

The greening of farm support subsidies does not generally happen in a policy vacuum, but occurs in a context of broader changes—specifically, changes in agricultural policy objectives, in how those objectives are interpreted, and in the choice of instruments (or approaches) used to pursue these. Indeed, the purpose of farm support may change over time. New objectives may be added, while others may fade to the background. Considering that multiple policy objectives always coexist, their weighting may shift over time. Furthermore, the interpretation of those objectives—what it means to be successful—may also

evolve. In addition, the instruments that are used to pursue those objectives may be reformed to align efforts with objectives and use public resources more effectively.

Farm support policies have evolved very differently across countries. But there are some widely observed patterns of reform that can be observed over the past 60 years or so of agricultural policy—or in a much nearer timeframe depending on the country—that it is fair to point out.

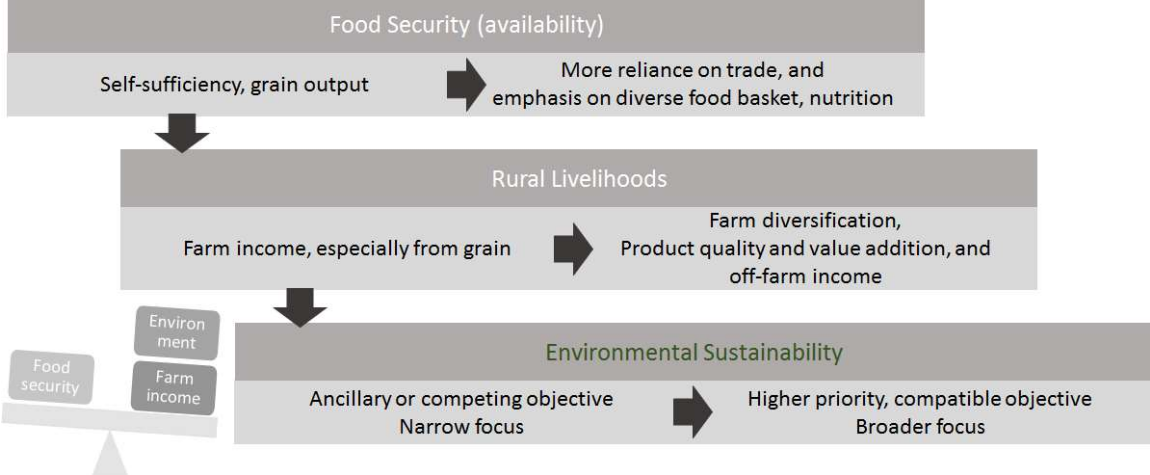
Often, the objectives of agricultural policy start out quite narrowly focused on ensuring basic food security—caloric adequacy provided by staple foods (evolving objectives). And over time, agricultural policy comes to embrace a widening set of objectives, including raising farmers’ living standards, and protecting the environment and ecosystem services (Figure 4).

At the same time, existing objectives often come to mean different things: there is an evolving concept of success (evolving interpretation of objectives). In the case of *food security*, for example, as domestic production rises and broader economic development progresses, the definition of food security as requiring self-reliance or self-sufficiency in staple grains is often relaxed to allow greater reliance on imports, and to emphasize a more diverse food basket. As food supply becomes calorically adequate, food security comes increasingly to be about ensuring dietary diversity or nutritional security.

Supporting *rural livelihoods* often becomes less about ensuring high grain output and prices, and more about enabling diversified farming activities, and about quality, value addition, farm sector competitiveness, and even activities other than farming strictly defined.

There is another shift that often takes place whereby the pursuit of *environmental protection* is increasingly seen as being compatible with other objectives of agricultural policy, and perhaps even helpful to achieving them. Today, environmental discourse has been embraced in the formulation of agricultural policy objectives in many parts of the world, but there is still a long way to go to give them weight and meaning.

Figure 4: Common patterns in the evolution of farm support objectives, and their interpretation



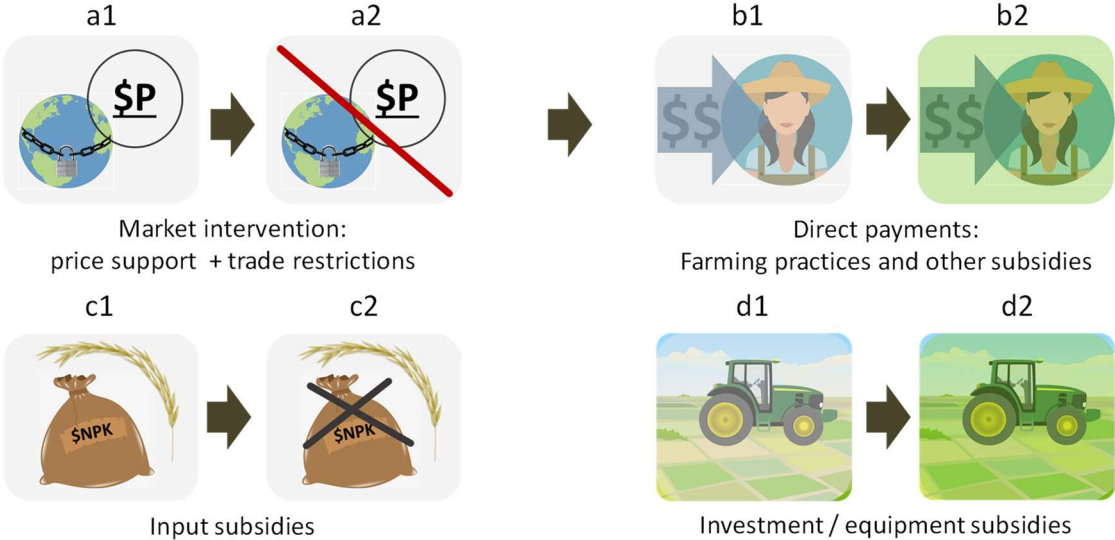
Turning now to the instruments that are used to pursue agricultural policy objectives, there are also discernible patterns in their evolution across countries to point out. Again, these examples do not hold universally, but for example, in many contexts, it was once a dominant practice to intervene in markets

to support the price of commodities or to defend a guaranteed minimum price through a combination of government purchases and trade restrictions—usually import barriers and export subsidies (Figure 5 icon a1). Under WTO rules, these instruments have largely been scaled back (Figure 5 icon a2). Trade in agricultural commodities has, to an extent, been liberalized, and direct intervention in commodity markets has been minimized in many parts of the world.

In several contexts, these instruments have been replaced with direct payments to farmers of one kind or another (Figure 5 icon b1). Direct payments are a very broad class of instruments, and while they may or may not be output-boosting, they certainly support farmers’ incomes. Furthermore, in various contexts, governments have put in place direct payment programs that tie the subsidy to green—environmental—farming practices (Figure 5 icon b2).

Meanwhile, various countries have also reformed their agricultural input subsidies. Some countries have done away with their fertilizer subsidies (Figure 5 icons c1 and c2). And some countries have made efforts to green their subsidies for things like agricultural machinery and other farm investments (Figure 5 icons d1 and d2). Many countries have kept productivity-oriented subsidies in place but reoriented them to be less taxing on the environment.

Figure 5: Common shifts in the choice of farm support instruments



International experiences reforming and greening farm support programs

Republic of Korea

Korea has an even higher level of farm support than Indonesia; its producer support estimate was around 50 percent of gross farm receipts in 2015 versus 29 percent in Indonesia. However, Korea spends its resources very differently than Indonesia, despite at least some commonalities between their sectors, such as a predominance of small rice farmers (**Box 1**).

Box 1: Snapshot of Korea's farm sector

By way of background, Korean agriculture is characterized by small farms—most of which cultivate rice alongside other products. A combination of factors, including regulations governing the sale and transfer of land and the role of land as a family asset to be preserved, have kept the average farm size small. Although the average area farmed per household in 2005 was almost 50 percent higher than in 1970, it was still only 1.4 hectares” (OECD 2008). As of 2013, Korea had about 1.1 million farm households, and the average farm size was still about 1.5 hectares (Sunchul, Dyck, and Childs 2016).

Over the last decade, the public sector has taken measures to encourage farm consolidation and value chain integration (OECD 2011). To encourage farms to grow larger, for example, the government has relaxed restrictions on (corporate) farmland ownership and investment, and modified regulations on farmland conversion. Meanwhile, the government has supported the so-called convergence of primary, secondary, and tertiary industries, seen as a means of supporting job creation and rural revitalization (OECD 2011). In 2009, the government created a fund to attract capital to various agricultural subsectors, including the food marketing and farm input ones. Nonfarm income has overtaken farm households' income from farming, which contributed 39 percent of household income in 2013.

Over time, the objectives and interpretation of Korea's farm support policies have changed a great deal. For example, the objectives of food security and improving rural livelihoods have been constants since the 1960s. But what these mean, and how they are to be pursued, have shifted over time (shift in interpretation and instruments); and other objectives have been added (expansion of objectives). The objective of food security has gone from being about achieving self-sufficiency, to allowing greater reliance on trade. Once focused on rice and barley, food security has now evolved to require the supply of a greater diversity of food products. The *interpretation* of what it means to support rural livelihoods has also shifted. Efforts to improve them were once focused entirely on farming, and they are now more broadly about the development of rural agroindustry.

Meanwhile, the *objective* of supporting farming households' income gained prominence in relation to food security after rice self-sufficiency was achieved in the late 1970s. And, other objectives have gained prominence over time, including those of increasing agro-industrial competitiveness, fostering a next generation of farmers (see companion note on this topic), and protecting the environment. Notably, Korea started phasing out its fertilizer subsidies more than 20 years ago.

In terms of *instruments*, in the 1960s and 1970s, Korea pursued rice and grain self-sufficiency, quite aggressively, through price support and trade restrictions. It also pursued this objective through the use of fertilizer, machinery, and other subsidies. As noted, Korea achieved rice self-sufficiency in the late 1970s. In the 1980s, with the Uruguay Round ongoing, Korea began liberalizing trade, lowering guaranteed prices for commodities, and it relaxed its objective of self-sufficiency. Food self-sufficiency fell, and farm support programs increasingly came to focus on things like diversifying food production and the development of agro-industry.

A turning point in the history of Korean farm support came after the Uruguay Round Agreement on Agriculture in 1995, after which, Korea spent the next decade or longer reforming its farm support programs to be less trade-distorting. From 1997 onward, Korea put in place direct payments to farmers that are based on farmland area as well as other conditions—including environmental ones. The largest direct payment program is for rice—and it was introduced in 2005, after the exceptional regime that was

negotiated for rice under the WTO expired (see more details on Korea’s rice and other farm support policies in Annex I).

During the 1990s, Korea also embraced environmental protection as an agricultural policy objective. In line with that, various environmental programs were put in place during that period. For example, between 1991 and 2005, the government spent about USD 1bn equipping the livestock industry with waste treatment and processing systems. In 1993, Korea introduced integrated nutrient management and integrated pest management programs. At the time, Korean farmers were on their way to becoming among the most intensive users of fertilizer and pesticides in the world (OECD 2008). Fertilizer subsidies were phased out gradually between 1996 and 2005, and starting in 2007, pesticides were made subject to a tax.

In 1999, one of the first direct payment programs that was put in place was the one for environmentally-friendly agriculture—a program that is still in place today, and helps farmers transition from conventional to either organic or pesticide-free farming. Another environmentally-oriented direct payment was instituted for landscape conservation in 2005. More recent green subsidy programs include ones that support the establishment of different kinds of environmentally-friendly farming areas, working through farmers’ organizations. There are also subsidies in place to support the marketing and consumption of organic products—in other words, programs that are influencing farming indirectly. Annex X provides more details on Korea’s environmental subsidy programs.

China

China is currently in the process of overhauling its farm support programs. The country has been engaged in a wave of significant agricultural policy reform since roughly 2014/2016 (policy/implementation). China is an interesting case in that it has a very brief history of supporting farms. It is only as recently as 2004 that China went from taxing agriculture to subsidizing it—on net. Agricultural subsidy programs predate 2004, but they increased significantly after that point.

Looking first at agricultural policy objectives, those that were most salient at that point in time—in 2004—were those of food security—still understood at the time as “self-reliance” in staple foods—and supporting farmer income. There were debates at the time about which of these should take priority, but ultimately, both were pursued.

Ten years later, in 2014, China’s #1 Central Document—the document that sets the direction for policy in the year to come—announced reforms to come. It called for both modernizing the farm sector, and developing the agricultural sector more sustainably. The aim of food self-reliance was relaxed at this point. And alongside the objective of farm sector modernization, China started to embrace the concept of sustainable agricultural development. In 2015, it adopted a strategy by that name.

Since roughly 2014, key directions of reform in China’s farm support policies have included: (1) relaxing its self-sufficiency objective—or rather that interpretation of its food security objective; (2) lessening market distortion; (3) greening agriculture (including via the sector’s consolidation and intensification); (4) modernizing the farm sector (through its consolidation, intensification, and professionalization)—without abandoning support for small family farms; and (5) better targeting subsidies (to bona fide farmers, especially grain farmers, and to other intended beneficiaries). More details on the evolution of

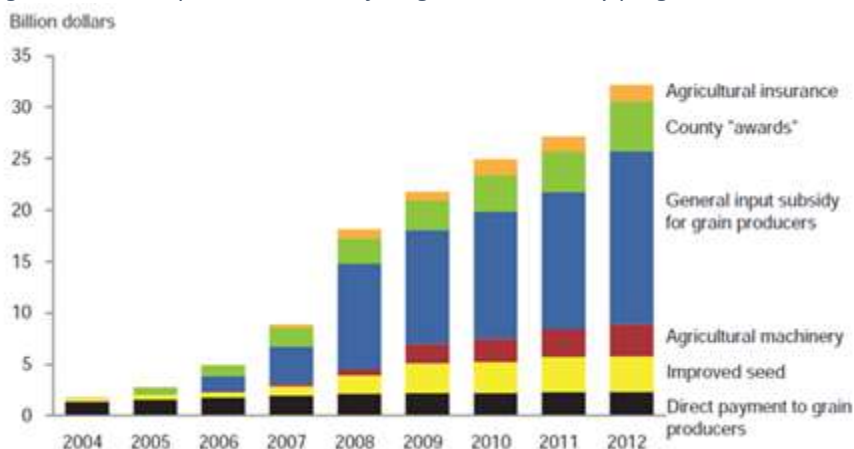
China’s farm support programs and its environmental subsidy programs specifically are provided in Annex II.

In relation to the embrace of environmental protection as a policy goal, President Xu Jinping’s address to the Chinese Communist Party in 2017 is often pointed to as representing a pivotal moment. “The modernization that we pursue,’ he said in his speech, ‘is one characterized by harmonious co-existence between man and nature.” While it has not yet progressed far down this path, China has possibly started looking at the policy objective of environmental protection as being compatible with, and even necessary for meeting its other objectives—such as those of developing a modern and competitive farm sector, and achieving higher rural living standards. At least this seems to be reflected in official discourse at the highest levels of government.

Just as the objectives of agricultural policy have shifted, so have the *instruments* used to pursue these. In 2004, in the early days of farm support, the key instruments were guaranteed minimum prices, which were ensured through a combination of government purchases and stockpiling, and trade protections. The other key instrument was farmer income support.

Around this time, four major output-oriented subsidies were put in place to support farmers’ income (and productivity): first, ones for improved seeds and advanced machinery, and payments for grain farmers; and in 2006, as input prices were rising, the “general input subsidy” was put in place.¹ This area-based payment to grain farmers quickly became the largest of these subsidies (Figure 6, blue bars).

Figure 6: China expenditures on major agricultural subsidy programs, 2004–12



Source: USDA Economic Research Service compilation of information from China Ministry of Finance in Gale 2013.

Note: Subsidies shown in this chart do not include those implicit in minimum price guarantees, (or ones corresponding to smaller spending programs).

By 2015, farm support had grown tremendously and there were more than 50 programs in place, including ones to support productivity and help farmers manage risk. Those programs included subsidies for fertilizer production in the form of lower energy and transportation costs, and value added tax exemptions, for domestic fertilizer manufacturers. There were even some programs for environmental

¹ The machinery subsidy was in the form of a discount on machinery purchases; the other three were area-based payments—though some provinces also provided improved seed at a discount.

protection in place. However, environmental protection was more of a side concern—and measures did not, in any case, avert the massive farm pollution problem China now faces.

After reforms were announced, in 2014, China started scaling up existing, payment for environmental services programs, including those in place to protect erodible land and build topsoil using agricultural residues. In 2015, the Sustainable Agricultural Development Plan called for zero growth in fertilizer and pesticide consumption by 2020, and for reigning in pollution from animal farming, and that year, China imposed a value-added tax on fertilizer. China also started putting more dedicated environmental subsidy programs in place. Those included programs for soil testing and the commercialization of formula and slow-release fertilizer; for testing lower-toxicity pesticides and more durable plastic films, and so on.

Then in 2016, China started down a path of major reforms, merging its three major income support subsidies—the general input subsidy and those for seeds and grain farmers (which for the most part functioned like direct payment programs). The resulting Protective Agricultural Subsidy, as the merged subsidy was called, made the payment to grain farmers conditional on “the *maintenance of soil fertility*”—giving one of the key farm subsidies an environmental orientation. Nominally, at least, since this condition has reportedly not been implemented in practice, although that may be changing at present (it seems that it may be getting more “teeth” in 2018, at least in certain provinces).

As an aside, the reform also took measures to better target small, active grain farmers. Meanwhile, in parallel to this, the government started phasing out minimum price guarantees for certain commodities. Between 2014 and 2017, it abolished those for cotton, soybeans, corn, and sugar, and as of 2018, the government is looking into reforming that for rice, and reportedly designing a new subsidy program for rice, soybean, and maize, for which no details are yet public (personal communication with Gale 2018).

Since, environmental considerations have continued to work their way into farm support programs. It is notable that nearly all of the farm support programs announced for 2018 invoke the environment. For example, subsidies for machinery are prioritized for green farming equipment. Support for extension services is meant to focus on “green, high-yielding, high efficiency” farming. And a full range of environmental pilot programs are being funded—relating to agricultural plastics, groundwater use, to the heavy metal contamination of soils, the building of top soil, the use of organic fertilizer resources, livestock waste management, and overfishing and overgrazing.

Vietnam

On a much smaller scale, Vietnam has some interesting programs in place that are leveraging government intervention in credit markets to encourage greener farming practices. To first put these examples in the context of broader agricultural policy, in recent years, Vietnam has come a long way in recognizing the significant environmental consequences of its agricultural success story of the last nearly three decades—whereby smallholder productivity has increased tremendously, food insecurity has plummeted, and Vietnam has become a top-five exporter of multiple commodities including rice and higher value products. The year 2014 marked a turning point in terms of embracing environmental sustainability as an objective of agricultural policy. That year, Vietnam adopted the Agricultural Restructuring Plan that recognizes the need to develop agriculture more sustainably going forward. This came on the heels of decades of output-oriented farm support policies that have paid minimal attention to environmental degradation. Among others, those policies included indirect fertilizer subsidies in the form of lower energy prices for domestic manufacturers, and farm credit subsidies, which are relevant to the coffee case presented next. Vietnam

has increasingly embraced a commercial approach to banking over the past 15 years (since 2003), but the state has continued to back a portion of agricultural lending—to ensure that credit is available for certain activities, and sometimes it has lowered interest rates in targeted ways (**Box 2**).

Box 2: A brief history of credit subsidies in Vietnam

Vietnam has a history of offering subsidized agricultural credit. Although the country has increasingly embraced a commercial approach to banking over the past 15 years, the state continues to back a portion of agricultural lending—ensuring that credit is available for certain activities, and sometimes intervening to lower interest rates.

The year 1993 marked a turning point in the evolution of agricultural credit in Vietnam, since this was the year when the government legalized the provision of commercial credit to farming households. The same year, the government allocated households land-use rights that could be used as collateral, and the Vietnam Bank for Agriculture and Rural Development (VBARD), a state-owned commercial bank also known as Agribank was established and began offering credit to farming households. At the same time, to ease the transition to the commercial provision of financial services, VBARD, which benefitted from state support in the form of statutory capital and operating facilities, offered those loans on preferential terms. And a law was adopted to ensure that farmers would be able to borrow up to VND 10 million without collateral (a sum that was doubled in 2000).

Ten years later, the government took measures to phase out agricultural credit subsidies. In particular, after it established the non-profit Vietnam Bank for Social Policies (VBSP) (2003) to provide small, low-interest loans to people living in remote areas, members of ethnic minority groups, students, and other low-resource populations, preferential credit was removed from VBARD's remit. This did not put a full stop to agricultural credit subsidies, however. The government continued to support lending to farming households on a targeted basis to support specific policy objectives. For example, in 2009 and 2010, the government responded to the food price spike by providing agricultural producers short-term concessional loans (with low interest rates and a long payback window) to procure machines, mechanical equipment, facilities, and farming materials (including fertilizers and pesticides). The aim of this program was to stimulate production capacity and industrial development in rural areas. In 2010, to further stimulate rural investment, the government raised the lending limits on noncollateralized loans for a range of agricultural actors (farming households, cooperatives, rural businesses) and activities (agricultural production, rural business and infrastructure development, the processing and consumption of agricultural products, trade in agricultural products and services).

(Source: Box based on OECD 2015b.)

In recent years, the government of Vietnam has experimented with using agricultural credit subsidies to incentivize more sustainable practices. In some cases, the subsidy directly supports investments in green technology. Starting in 2009 for example, the government started making preferential loans available for investments expected to reduce post-harvest losses across an expanding range of agricultural products (OECD 2015b).² Most recently, the government has begun *leveraging* specialized financial products—

² These are relevant to the environment, to the extent that output that never reaches end consumers represents a waste of all the resources involved in producing and moving the product. Eligible equipment included dryers, machines used for the cultivation and harvest of rice, coffee, tea, and sugarcane, and machines used for aquatic production and cold storage. The loans, which were channeled through five state-owned commercial banks, could be for an amount equal to the full price of a new

products made available by the intervention of government to enable specific kinds of long-term agricultural investment—to encourage greener farming practices. The government is doing this by making access to these financial products conditional on the adoption of specified practices or technologies. Since 2015, through the World Bank-supported Sustainable Agriculture Transformation Project, the government has been applying this model in the context of coffee growing in the Central Highlands and of rice growing in the Mekong Delta region. In 2017, the government extended this model to “high tech and clean agriculture.” More details on the use of agricultural credit subsidies to encourage greener practices are provided next.

Leveraging credit for tree-replanting to green coffee growing

In the context of coffee production, the government is taking advantage of the broadly experienced need for (public sector-backed) credit among coffee growers to plant new trees to incentivize more sustainable growing practices. Most coffee in Vietnam is grown in the Central Highlands, and much of the standing tree stock there is nearing the end of its productive life. As of 2015, when the World Bank-supported Sustainable Agriculture Transformation project began, at least one third of the coffee growing area was estimated to be in need of renewal, or more than 210,000 hectares.³ Indeed, much of the existing coffee growing area was planted during the 1990s and early 2000s, and while well-managed plantations can continue to generate high yields beyond 25 years, many farmers in the Central Highlands, Vietnam’s coffee growing region,⁴ were said to be experiencing declining productivity after just 15 years (Havemann et al. 2015). Coffee growing in Vietnam is known to depend on heavy applications of groundwater and fertilizer, and in recent years, it has encroached onto unsuitable and forested lands (**Box 3**). These practices have not helped the tree crop perform optimally.

machine. The state subsidized 100 percent of the interest in the first two years, and 50 percent from the third year onward. Concessional credit was also made available for investments in storage facilities.

³ The area planted to coffee in the Central Highlands was about 635,000 hectares in 2014 (Havemann et al. 2015).

⁴ The region accounts for about 90 percent of national production.

Box 3: Coffee growing in Vietnam: weak incentives for sustainable production practices

The expansion of coffee has not been a model of sustainability in Vietnam, where overirrigation and groundwater depletion and the overuse of nitrogen-based fertilizer have become the standard practice, and where planting has been pursued on land that is unsuitable for coffee due to soil type, land slope, climatic conditions, or water availability—sometimes encroaching⁵ into forestland (Havemann et al. 2015). Even though Vietnam has the world’s highest average yields for Robusta coffee, the mismanagement of soil and water resources has reportedly started to take a toll on the tree crop’s productivity, acidifying soils and increasing trees’ vulnerability to disease, leading to groundwater shortages and constraining irrigation in drought years, stunting yields and farmers’ earning potential, and possibly jeopardizing growers’ ability to maintain as high a level of productivity in the decade to come.⁶ The excessive use of agrochemicals and conversion of natural landscapes, with their contributions to pollution, climate change, and habitat destruction, also have external costs in terms of human health, wildlife health and biodiversity, and economically-valuable ecosystem services such as the provisioning of clean air and water, and recreational landscapes.

This state of affairs reflects, among other things, the fact that the market has not sent producers adequate signals to produce more sustainably. Premiums for sustainability-certified coffee are low compared to its costs, and product differentiation is difficult or costly to maintain because of the market structure. Furthermore, the sustainability standards that enjoy some market penetration, such as 4C and others, do not preclude a number of environmentally questionable practices such as excessive and poorly timed irrigation. And for one reason or another, farmers are not factoring in the detrimental effects of their farming practices on trees’ productivity and lifespan, on their farms’ input costs, and on their bottom line.

In order to maintain their plantations’ productivity, coffee growers need to start replanting a next generation of trees, factoring in the 3-5 years it takes for trees to reach peak yield. However, that time lag between planting and profitability means that most farmers—most of which have very small farms—require financing. But adequately long-term financing was not readily available for this purpose, such that enabling the coffee tree stock’s renewal would require government intervention. It is often the case that enabling and ensuring the timely renewal of tree crop plantations calls for public sector support, especially in a sector dominated by very small farms, as is the case in Vietnam’s coffee sector.

Faced with this situation, the government put two and two together, turning two needs into an opportunity. Recognizing the need to help farmers finance tree replanting on the one hand, and the need to incentivize greener farming practices among coffee growers on the other, the government has established a program that gives farmers access to credit⁷ with strings attached.

Conditions include that farmers take training in green production methods, and plant on suitable land. At the same, under this World Bank-supported project, farmers are also gaining access to higher quality planting materials and credit for higher efficiency irrigation equipment. In other words, the government is leveraging a credit subsidy for coffee tree replanting to encourage more sustainable farming practices.

⁵ Satellite imagery from 2014 showed that the actual area planted in the Central Highlands (635,000 hectares) was more than 25 percent larger than what official statistics showed in 2010 (493,000 hectares) (Havemann et al. 2015).

⁶ One 2013 study warned of impending soil exhaustion, for example (Technoserve 2013).

⁷ The credit is channeled through five commercial banks.

By the end of 2017, sustainable coffee production methods had been adopted on 9,250 hectares of participating farmland, and participating farms saw their profits increase by an average of 23 percent from baseline.

Leveraging finance for long-term investments to green rice farming

In rice farming, similarly, the government has developed a program that is leveraging specialized finance for green purposes. Under a World Bank-supported project in the Mekong Delta, where rice is intensively produced, the government is providing finance, mostly in the form of matching grants to farmers' cooperatives, in exchange for farmers taking training in more environmentally friendly rice growing protocols described below. Again in this case, the finance is for long-term investments like land-leveling, harvesting and drying equipment, storage, and other investments with long payback periods. The program is also helping to link participating farmers' organizations to agribusinesses looking to source higher quality and more sustainably produced rice—the gained business opportunity for farmers being the incentive.

In several provinces, farmers have received training on crop rotation—an approach that can help reduce reliance on agrochemicals—VietGAP—a set of “good agricultural practices” including ones meant to reduce pesticide residues in food—and the utilization of the byproducts of rice farming. Others have received training on a Vietnamese rice farming protocol known as 1 Must and 5 Reductions (1M5R), and a predecessor protocol known as 3 Reductions and 3 Gains (3R3G). 1M5R calls for farmers to use certified seeds (the “1 must”), while reducing the use of four production inputs (seed, water, pesticides, and chemical fertilizers) and postharvest losses (the “5 reductions”). This way, the program is encouraging farmers to reduce and otherwise improve the use of synthetic fertilizer and pesticides, reduce the use of irrigation water, and recycle rice straw. The program is also helping to link participating farmers' organizations to agribusinesses looking to source higher quality and more sustainably produced rice—the gained business opportunity for farmers being the incentive.

Subsidizing credit for high-tech and clean agriculture

In 2017, the government adopted a measure that requires commercial banks to make credit available at below-market rates for high-tech and climate smart agriculture. For this purpose, the State Bank of Vietnam established a USD 4.4 billion (VND 100 trillion) line of credit for Agribank, Vietcombank, and the Bank for Investment and Development of Vietnam to disburse. Interest rates beat market rates by 0.5–1.5 percentage points, depending on their length (Viet Nam News 2017, Penn Wharton Public Policy Initiative 2017). A possible shortcoming of this program is that it has seemingly not developed a clear set of criteria to determine lending eligibility (Minh Khue 2015). It is unclear, moreover, that investments in “high tech” agriculture are also screened for environmental impact. Such shortcomings could, however, readily be addressed in similar investment programs.

European Union

The European Union's Common Agricultural Policy (CAP) has a much longer history. In terms of objectives, when it was first put in place in 1963 and throughout its first decade, it was largely focused on basic food security—defined as ensuring stable food supply and prices—at a time when Europe was still recovering from World War II. Supporting rural livelihoods was another objective of the CAP from the start, and it gained prominence in later decades.

In the early days of the CAP, the key instrument for supporting food production was minimum price guarantees, that were ensured by a combination of direct market intervention by public commodity organizations, as well as import restrictions and export subsidies. By the 1980s, Europe was facing what it refers to “food mountains”—vast food surpluses of food that were either destroyed or “dumped” into international markets.

In 1993, a major shift took place, and the *objective* of supporting farmer income took center stage. The CAP essentially went from supporting products, through prices, to supporting farmers—through direct payments. At the time, payments to farmers were tied to their output, and the next major CAP reform would address that by decoupling farm payments from production (Box 4). At this stage, market intervention was significantly minimized, and turned into a safety net program. Then, going into the new century—with the adoption of Agenda 2000 in 1999—the EU adopted what is known to this day as the CAP’s second pillar, focused on rural development. The first pillar groups direct payments and market intervention.

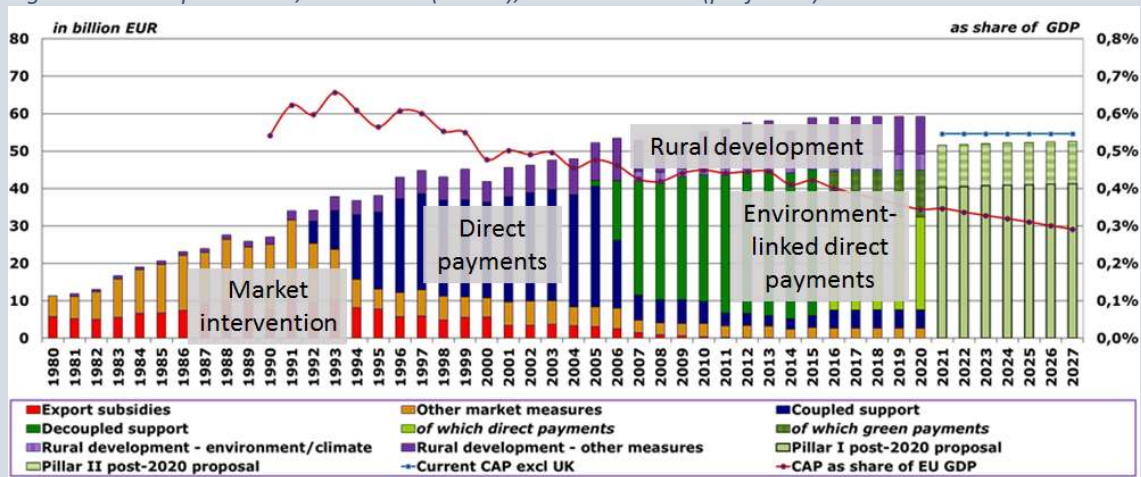
Box 4: The evolution of CAP spending: from market management to income support

The composition of CAP expenditure has changed dramatically since its inception, reflecting the path of reforms (Matthews, Salvatici, and Scoppola 2017). In the early decades of the CAP, most expenditure consisted of expenditure on market management and export subsidies. Following the 1993 reform, this pattern of spending gave way to coupled direct payment expenditures, and later, spending on decoupled direct payments following the reform of 2003.

The shifts in the weighting of different CAP objectives, and in the choice of instruments, stand out clearly in Figure 7, which shows the evolution of EU farm support spending from 1960s onward. In this figure, the first visible shift is that from market management (in yellow and red) to direct payments (in blue)—the shift from supporting products to supporting people. The next one on display is the rise in importance of rural development, and supporting rural livelihoods (purple bars at the top). The next visible shift is the increase in the importance of supporting livelihoods over supporting output and the emergence of environmental awareness, with the decoupling of income support payments from output

and the tying of these to environmental conditions. At the same time, the figure shows the decline in overall CAP spending as a share of the EU's GDP since the 1990s (red line).

Figure 7: CAP expenditures, 1990-2016 (actual), and 2017 -2027 (projected)



Source: EC-DG AGRI (labels added by author).

Note: Budget figures are actual until budget year 2016, programmed from 2017-2020, and based on the MFF proposal for 2021-2027.

Meanwhile, during the 1990s, the concept of sustainable development rose as a policy objective in the wake of the Rio Earth Summit of 1992. During this decade, the EU took up what are called agri-environmental payments—subsidies for a variety of voluntary environmental activities on farms. By the end of the 1990s, the CAP required all member states to offer agri-environmental payments under the rural development pillar.

The next major reform in 2003 brought the two objectives of supporting rural livelihoods and environmental protection together. The CAP reform of 2003 instituted the policy of “environmental cross-compliance,” which made direct payments to farmers—by far the largest farm support program in the EU—conditional on complying with environmental law (Box 5). In other words, the EU greened its direct payments. With this reform, it also made payments based on farmed land area rather than on output. In 2013, the CAP went even further in this (environmental) direction by instituting “greening payments.” This reform siphoned off 30% of direct payments to farmers and made them conditional on taking up a set of green farm management practices.

Box 5: Conditions for receiving direct payments under the EU's Common Agricultural Policy

Cross-compliance obligations:

1. Statutory management requirements (SMRs): farms must comply with around 18 laws and regulations relating to the environment, food safety, animal and plant health, and animal welfare.
2. Good agricultural and environmental condition (GAEC) standards: farms must comply with minimum land management practices relating to soil quality and erosion, water quality, and wildlife habitat.

Greening requirements:

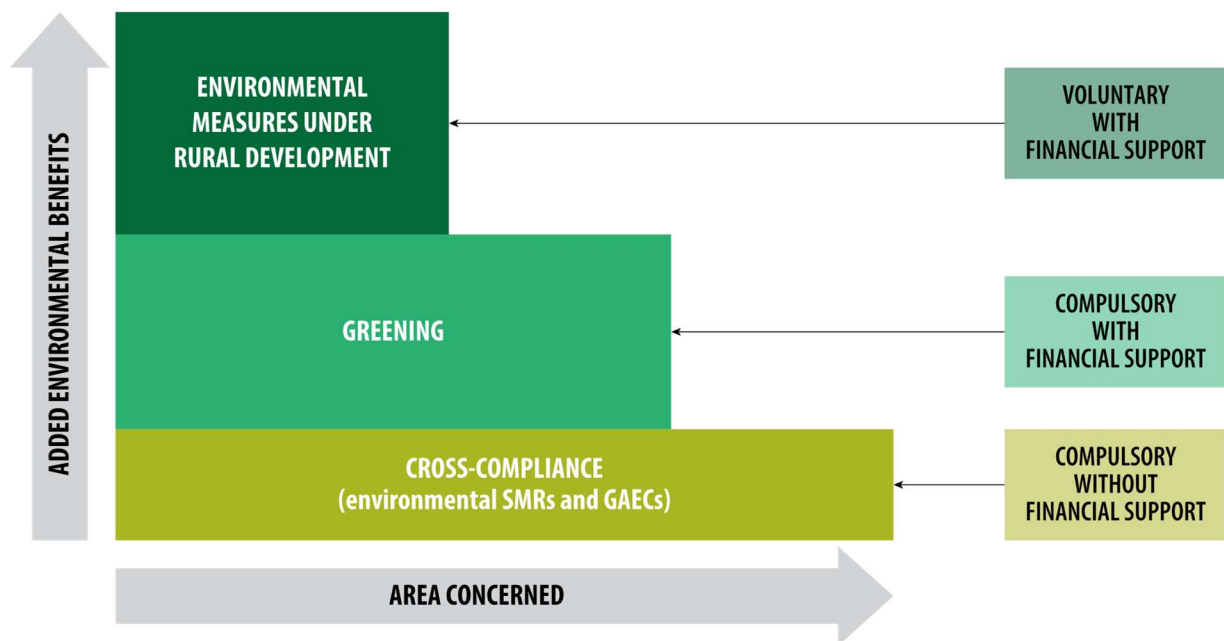
1. Crop diversification: farms must grow at least 2 or 3 crops depending on their size.

2. Ecological focus areas (EFAs): farms must maintain EFAs, which restrict farming practices, on at least 5 percent of their land.
3. Permanent grasslands: the ratio of permanent grassland to farmland at the national or regional level must change by less than 5 percent. Measures may be imposed on farms by national or subnational authorities if the ratio changes by more.

Under its rural development program, the EU also continued to offer a variety of environmental subsidies supporting voluntary measures. There are subsidies for so-called agri-environment and climate measures going beyond “greening” measures; subsidies for organic farming and forest conservation; and payments for maintaining protected areas, among others. These are generally more environmentally stringent than the EU’s direct payment programs, but they are targeted to a much narrower base of farmers.

Figure 8 depicts the architecture of green subsidies under the CAP. Cross-compliance applies to the widest area of farmland and is the weakest in terms of environmental stringency. It is also compulsory. Greening payments apply to slightly less farmland, are slightly more stringent environmentally, and are also compulsory. Finally, as noted, the environmental measures under the CAP’s rural development pillar mostly target the smaller number of farms that undertake environmental measures on a voluntary basis.

Figure 8: Architecture of green subsidies under the EU’s Common Agricultural Policy



Source: based on EC 2016a in ECA 2017.

Understanding the greening of the CAP in its political and economic context

As noted earlier, farm subsidy reforms are best understood in their political and economic context, and this is certainly true of CAP reforms (this point elaborated further in Annex III). The CAP reform that put greening payments in place offers an illustration of this. Indeed, in terms of environmental effectiveness, greening payments have proven rather weak, raising the question of how this reform took shape as it did. Greening payments require most farms to meet three environmental management conditions (**Box 5**). But at the time these were put in place (effective 2015), the vast majority of farms were already conforming to the required green practices. Even though about 75 percent of farmland was subject to at

least one greening requirement, less than 5 percent of farmland subject to greening requirements needed to change management practices (EC DG-Agri 2018, ECA 2017, OECD 2017a). Why did the EU go to so much trouble to overhaul its major farm subsidy program, only to implement a weak policy?

A first element of perspective on this is that greening payments are one instrument that is being used to pursue more than one policy objectives: supporting farmers' incomes, and protecting the environment. On the one hand, the greening reform illustrates how multi-purpose instruments increase the potential for the inefficient (and ineffective) use of resources. Greening payments do a better job at supporting farmers' income than they do at protecting the environment. If the *primary* objective of the reform had been to protect the environment, the EU could have reformed direct payments differently. The EU could have transferred direct payment funds under pillar 1 to agri-environmental payment programs under pillar 2, vastly bolstering funding for voluntary agri-environmental measures going above and beyond business-as-usual. Instead, not only were income support direct payments maintained, but a low environmental bar was set for accessing these. In this case, organized farm interests clearly prevailed over environmental ones. And other circumstances were also certainly at play. It is possible that the 2008 food price crisis engendered a conservative climate for reform. And another consideration is that member states are generally reluctant to see pillar 2 grow because, unlike pillar 1, it is co-financed by member states.

On the other hand, what the greening of direct payments was in fact effective at accomplishing as a multi-purpose instrument is, first, decoupling income support from farm output. Second, maintaining an otherwise questionable program of supporting farmers' incomes in place. Indeed, in the EU context, farmers are no longer the underprivileged group they once were. And third, putting in place an architecture that could accommodate more stringent environmental conditionality at a later stage—and this, tied to the EU's largest agricultural subsidy program. In fact, this eventuality is currently under consideration for the next phase of the CAP, beginning in 2020.

United States

While the history and architecture of farm support in the United States differ markedly from those of the EU, they are similar in some important ways. The United States has an even longer history of supporting farmers' livelihoods (the EU being a more recent creation), and its approach to pursuing that objective has shifted over time. In particular, as in the EU, it has gone from relying on price support and direct market intervention, to using various forms of direct payments to farmers. A key turning point in that respect being the farm bill of 1996, which took steps to dismantle the price support and supply management programs that were put in place by the first farm bill, in 1933 (although the 2002 farm bill introduced countercyclical payments).

The United States and EU also share a somewhat similar green subsidy architecture, whereby, on the one hand, income support subsidies are available on condition that certain environmental conditions are met, and on the other hand, a range of environmental activities benefit from direct support. From an environmental perspective, a landmark farm bill in the United States was that of 1985, since it devoted an entire section of the farm law to conservation programs (including new ones) and established "conservation compliance," which requires farmers in certain zones to create soil conservation plans in order to benefit from a range of other farm subsidies. This policy is akin to the EU's policy of cross-compliance, which requires farmers to comply with environmental laws to qualify for direct payments.

The United States also has various conservation programs in place that are similar to the EU's various agri-environmental subsidies under the CAP's rural development program in that they support voluntary conservation measures. These generally offer farmers (or other stakeholders) financial and technical assistance for voluntarily (1) retiring sensitive land from agricultural production, (2) adopting environmentally-friendly production practices on working agricultural lands, (3) establishing easements to protect the agricultural nature of the land (that is, preventing its conversion to residential or commercial uses), (4) addressing regional environmental challenges, and (5) passing organic certification.⁸ The largest of the conservation programs is the Conservation Reserve Program, at around USD 2 bn per year, or 7 percent of direct payments in 2014. Marked by the Dust Bowl of the 1930s, when vast amounts of topsoil were lost to wind erosion, the United States put that program's first predecessor in place as early as 1936. Protective measures were expanded in the 1950s, and several more programs were added in 1985 (notably, the Environmental Quality Incentive Program, EQIP) and 2002 (notably, the Conservation Stewardship Program, CSP) (**Box 6**).

Box 6: Major conservation programs in the United States (in the 2014 Farm Bill)

- The **Conservation Reserve Program** (CRP) pays farmers to remove environmentally sensitive land, including wetlands, from production and maintain it under beneficial vegetative cover (such as native grasses, wildlife plantings, trees, filterstrips, riparian buffers). Under the CRP, farmers receive rental payments under 10–15 year contracts with the government. They may also receive additional funds to cover part of the cost of establishing vegetative cover. Not competitive.
- The **Environmental Quality Incentive Program** (EQIP) provides technical and financial assistance to farmers for adopting natural resource conservation and environmentally beneficial practices on working farms, ranches, and forests. The program, which dates from 1996, selects farmers to receive assistance, prioritizing applicants on vulnerable lands and in degraded watersheds, and with innovative proposals. Competitive
- The **Conservation Stewardship Program** (CSP) supports new and ongoing conservation efforts for producers who maintain or improve their conservation system on working agricultural and forest lands. Competitive.
- The **Conservation Innovation Grants** (CIG) program provides grants on a competitive basis to one-to-three-year conservation projects addressing emerging and high priority natural resource concerns at the watershed, regional, or multi-state level.
- The **Agricultural Conservation Easement Program** (ACEP) provides financial and technical assistance for land owners to prevent the conversion of agricultural land and wetlands to non-agricultural uses. It supports Agricultural Land Easements and Wetlands Reserve Easements.
- The **Regional Conservation Partnership Program** (RCPP) supports efforts to coordinate conservation program assistance at the regional or watershed scale. This program merged the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative, the Great Lakes Basin Program, and the Agricultural Water Enhancement Program.
- The **USDA Organic** program is not a conservation program per se, but includes assistance to farmers to get certified against the USDA Organic standard.

More details on these programs are provided in Annex IV.

⁸ This is offered under the USDA Organic Program, which is not typically considered a conservation program.

India

India is in the throes of reforming its fertilizer subsidy program, and specifically, taking steps to improve its targeting. In India, domestic fertilizer manufacturers benefit from a transportation subsidy, but also a USD 10.6 billion a year (152.6 trillion rupiah) subsidy that applies toward the retail price of fertilizer, which is capped (Insights IAS 2016). As a result, the price of urea in India is among the lowest in the world. However, there are questions as to this program's efficiency.

Over the years, there has been a declining response to the subsidy in terms of kilos of grain produced to kilos of fertilizer consumed. This is attributed to various factors including the imbalanced and inefficient uses of fertilizer. In fact, to address the problem with fertilizer's inefficient application, the government started subsidizing neem-coated urea at a higher rate in 2015, since that treatment slows the release of fertilizer and reduces losses (while acting as a natural pesticide) (Padhee 2018).

Another challenge with the fertilizer subsidy program is that it suffers from considerable leakage, with subsidized fertilizer going across the border to neighboring countries. One study found that a full 65 percent of the fertilizer did not reach its intended beneficiaries in 2015-6 (Insights IAS 2016).

To address this, starting in March 2018, the government started rolling out a reform of the fertilizer subsidy, moving to what it calls the Direct Benefit Transfer (DBT) system, which it piloted in 2017. The central change is that the government is transferring the fertilizer subsidy to manufacturers on the basis of sales rather than on the basis of production as it did previously.

The reform is relying heavily on technology. It is using point-of-sales machines that are equipped with fingerprint scanners and that are linked to Aadhar, India's national, biometric personal identification system, as well as to land records to verify eligibility—though farmers do not have to be land owners to benefit—and to manufacturers' inventory management systems (fertilizer has to be in stock for a sale to go through). Importantly, the point-of-sale machines are also linked to farmers' soil health cards, which are meant to be used to determine how much fertilizer a farmer can buy, the purpose being to limit leakage and waste—although it has been reported that farmers are not, currently, being denied sales on the basis of these cards. In that sense, the reform has the potential to be a greening measure.

The point-of-sales machines use a dedicated tracking system to integrate all of this information and determine how much to sell to farmers, and how much and when to pay fertilizer manufacturers. The government has committed to paying farmers within seven days of a transaction. Perhaps not surprisingly, given the technical sophistication of this new system, during the pilot phase in 2017, problems were reported in areas with low internet connectivity, and authentication failures were not uncommon (at a rate of 10–20 percent) (Chari and Shrivastava 2017). There were also some issues with the link to manufacturers' inventories. Clearly, this is an ambitious reform in terms of technological sophistication, if less so from a political economy standpoint, since it is not putting the subsidy itself in question.

Common patterns of reform

Conceptually, when it comes to greening agricultural subsidies, it is possible to group reforms into three broad buckets. Each is described in turn, and illustrated using the country examples discussed above.

(1) The first type of reform involves the creation of new agri-environmental subsidy programs, or the ramping up of existing ones.

Examples include Korea's establishment of direct payments for environmentally-friendly farming, China's ramping up of various payment for ecosystem programs, the EU's establishment of agri-environment and climate payments, and the establishment, in the United States, of various conservation programs. The subsidies involved in these reforms typically have environmental protection as primary objective, support voluntary actions, and represent a relatively small share of farm support spending.

(2) The second type of reform involves tying existing subsidies to the environment, or in other words, leveraging existing subsidies to advance environmental objectives. The prime examples are the EU's adoption of cross-compliance and greening payments, whereby it has made income support payments to farmers conditional on meeting environmental requirements, and the United States' adoption of conservation compliance, which requires farmers in certain areas to make conservation plans in order to access other subsidy programs. As discussed under the EU example, those conditions have the potential to be far more demanding from an environmental perspective. On a smaller scale, Vietnam has recently used credit or other financial subsidies to coffee and rice growers as an opportunity to push farmers toward greener farming practices—ones that ought to benefit their bottom line in the near term and certainly in the long run. Reforms in China and India—in China, of its direct payments, and India, of its fertilizer subsidy—are examples of reforms that are applying environmental conditions in theory, but probably not in practice.

The subsidies involved in these reforms typically have environmental protection as ancillary objective. However, they can support either mandatory actions (as in the EU) or voluntary ones (as in Vietnam), and can represent either a large share of farm support spending (as in the EU, United States, and China), or a small one (as in Vietnam).

(3) The third type of reform involves changes to subsidies that are not specifically about environmental protection, but that have an indirect, sometimes structural impact on the environment. This type of reform could involve establishing, removing, or modifying the subsidies in question. One example is the removal of fertilizer subsidies in Korea, between 1996 and 2005. To take a more hypothetical example, in China, subsidies are being put in place to support the consolidation and intensification of livestock production, a direction that is seen as positive for the environment. That said, this may prove to be near-sighted and the wrong direction to be going in: in fact, the removal of subsidies supporting the scale-up of the livestock sector could be one of the most significant actions a government could take to support human and environmental health—given the sector's outsized footprint in terms of resources and environmental emissions, food safety burden, and nefarious dietary health consequences. In general, the subsidies involved in these reforms may be harming the environment unintentionally—by for example supporting inefficient fertilizer use, or the livestock sector's expansion. Furthermore, they can represent a large share of farm support, such that their removal can be more impactful than the creation of small environmental subsidies.

Annex I: Republic of Korea: agricultural subsidy reform with a focus on efforts to green farm support

A brief history of agricultural policy

Korea has long had among the most supported agricultural sectors in the OECD alongside Japan, Norway, Iceland, and Japan (OECD 2017b). And just as this high level of support has been a constant, so has Korea's focus on food security, defined (confusingly) as a "joint reliance on trade, domestic production, and food self-sufficiency" (Beghin and Bureau 2015). Food security has remained a prominent goal of policy even though Korea conquered the worst of food insecurity long ago, when it went from experiencing severe food shortages in the 1960s to achieving food self-sufficiency in the late 1970s (Im and Jeong 2014).⁹ Nonetheless, Korea's agricultural policy objectives have evolved over the past 50 years, coming to be increasingly about supporting the income of farming households, and later, about things like farm consolidation and environmental protection.

Through the 1990s—and into the 2000s for rice—agricultural subsidies mainly consisted of guaranteed minimum prices for agricultural commodities supported by government purchasing programs, together with high tariffs that protected domestic producers from foreign competition. Under the "double grain price system," the government bought grains from farmers and sold them to consumers at a lower price (Joo 2015). At the same time, high import tariffs were applied to rice, meat, and dairy products, and many non-tariff barriers (including administrative barriers, import monopolies, and sanitary restrictions) protected the domestic markets for many commodities. To a lesser extent, the government also supported production via direct payments to farmers, and subsidies for such things as fertilizer and credit (Beghin and Bureau 2015).

Korea's rice-focused policy of price support has been gradually reformed since the mid-1990s. After the Uruguay Round Agreement came into effect in 1995, Korea started introducing direct payments to continue supporting farmers' income while distorting farmers' production decisions less. The largest of these direct payment programs is the one that supports rice farmers' income, but it was not introduced until 2005 (see Box 7 on rice support policy). Before that, direct payments were put in place for early retirement (1997), environmentally-friendly agriculture (1999), and less favored areas (2004).¹⁰ In 2005, direct payments were also put in place (alongside rice income support) for rural landscape conservation, and FTA damage compensation (accounting for lower prices).¹¹ In 2012, a direct payment for upland farmers was added to these. In 2001, a subsidized crop insurance program was also put in place (Im and Jeong 2014). While these are first and foremost income support programs, they also support secondary policy objectives, including those of farm consolidation and environmental protection.

⁹ During the 1960s and 1970s, the use of agricultural machinery, agrochemicals, and improved seed use became widespread, irrigation improved, and rice yields (rough or unmilled) rose by about 87 percent (from around 4 tons per hectare to between 6 and 7). During the 1970s, the government also tried to decrease rice consumption to order the gap between domestic supply and demand (Sunchul, Dyck, and Childs 2016).

¹⁰ The government counts the latter as an agr-environmental payment.

¹¹ In 2008, in an attempt to improve subsidy targeting, monitoring measures were put in place to minimize payments to noneligible landowners (OECD 2011).

As direct payment programs multiplied, so did their share of agricultural spending. Spending on direct payments rose from 0.8 percent of agricultural spending in 1997 to 9.6 percent in 2012. Direct payments for rice accounted for 68 percent of total agricultural direct payments (Im and Jeong 2014).

Box 7: Korea's rice (price) support policies

Between 1948 and 2005, the government of Korea supported domestic rice prices by purchasing much of the country's output. Starting in the 1970s, the government paid more for the rice than it charged consumers, and protected this system with a ban on most rice imports. In 1990–94, prior to the Uruguay Round Agreement coming into force in 1995, farmers received prices that were 180 percent of their cost of production. Since that time, even though rice consumption has markedly declined and farming substantially diversified, rice remains highly protected.

In 2005, the Direct Payment Program for Rice Income Compensation program started offering active rice farmers¹² two types of payments. The first is the area payment, which is paid on the basis of historical rice plantings using 1998–2001 as a baseline, and therefore decoupled from production. The other payment is a deficiency payment that covers most¹³ of the difference between the post-harvest price and a target price.¹⁴

Meanwhile, until the end of 2014, Korean rice benefited from an exceptional regime under WTO rules. When it expired in 2015, the ban on rice imports was replaced by a tariff-rate quota system, under which rice imports above a threshold faced a dissuasive tax rate.¹⁵ (Box based on Sunchul, Dyck, and Childs 2016, and KREI 2015.)

Environmental subsidy reform

Since the mid-1990s, a number of reforms have been adopted to move in the direction of greening agricultural subsidies. In 1993, integrated nutrient management and integrated pest management programs were introduced, and starting in 1996, agrochemical price policies followed suit. Fertilizer subsidies were phased out gradually between 1996 and 2005, and pesticides were made subject to a tax starting in 2007.

For a time, Korean farmers became among the most intensive users of fertilizer and pesticides in the world (OECD 2008). By 2015, fertilizer use intensity had declined by 44 percent from its peak in 2005 (based on FAO 2018 data), and in absolute terms, was less than half the peak level it reached in 1997 (based on IFA 2017 data). Pesticide use, however, has hovered at the high rate of 11–15 kg per ha for a long time (at least since 2000 based on OECD 2008 and FAO data from 2002 to recent).

¹² The variable payment is given only to farmers who are currently producing rice on registered farmland.

¹³ If the post-harvest price is lower than the target price, farmers receive 85 percent of the difference, after deduction of the fixed payment. A fixed national reference yield is used to calculate the payment per hectare (Im and Jeong 2014)

¹⁴ Total deficiency payments were USD 635 million (KRW 718.7 billion) and area payments were USD 745 million (KRW 843.1 billion). The deficiency payment is the same per kilogram for all rice farms. Thus, the policy encourages higher output irrespective of quality (Choi and Myers 2015, and Sunchul, Dyck, and Childs 2016).

¹⁵ a tariff of 513 percent for over-quota imports.

Environmentally-oriented reforms stepped up after the passage of the Environmentally-friendly Agriculture Promotion Act of 1997.¹⁶ In 1999, the government introduced direct payments for environmentally friendly agriculture, a program that is still in place today.¹⁷ Its budget in 2018 was about 38.7 million (KRW 43.5 billion)—although only USD 23.5 million (KRW 26.4 billion) were budgeted for crops, the remainder being for livestock (see below) (MAFRAK 2018 personal communication). Farmers were (and still are) paid for the number of hectares on which they conform to defined sets of environmentally friendly farming practices. The payment amount is based on the estimated difference in cost between conventional and environmentally-friendly farming. Higher payments are offered for organic farming compared to pesticide-free farming.¹⁸ These direct payments were (and still are) meant to help farmers transition from conventional to environmentally-friendly practices, and as such, are available to farmers for a maximum of three to five years.¹⁹ After that period, farmers are expected to sell certified products that allow them to pass through the costs of farming to buyers.

In 2005, another environmentally-oriented direct payment was put in place, this time for rural landscape conservation. A budget of USD 8.3 million (KRW 9.3 billion) was allocated to these in 2018. And in 2009—after a 2004 pilot—direct payments for HACCP-compliant, organic livestock production were added to those for environmentally friendly crop farming (MAFRAK 2018 personal communication). In 2018, just under USD 15.5 million (KRW 16.6 billion) were budgeted for livestock payments (MAFRAK 2018 personal communication). Overall, agri-environmental direct payments represented 2 percent of total direct payments in 2018 (MAFRAK 2018 personal communication)—or 4 percent if payments for less favored areas are counted as environmental ones.

Several other agri-environmental subsidies are in place (Kim and Lim 2015).

Already, between 1991 and 2005, to address the problem of nutrient pollution from the livestock industry—especially from pig farming—the government spent on the order of USD 1 billion subsidizing facilities and equipment for the processing of livestock manure. By 2002, 98 percent of livestock farmers were equipped with a processing system (OECD 2008).

Starting in the 2000s, subsidies channeled through subnational government entities were introduced to help finance the establishment of designated environmentally-friendly farming areas, working through farmers' organizations. These subsidies help finance facilities and equipment for production, distribution, and training in areas of at least 10 hectares and involving more than 10 farming households in environmentally-friendly farming.²⁰ In the mid-2000s, a distinction was made between two kinds of areas: district-level ones, and wide-area complexes. The latter are areas of over 600 hectares, and support for them comes in the form of three-year financing packages that are 40 percent supported by national funds, 40 percent supported by local government funds, and 20 percent self-financed. Funds can be used to

¹⁶ Since, the government has been adopting five-year plans for ecofriendly agriculture. The first was the Plan for Environment-Friendly Farming Practices, for the years 2001–2005 (Kim and Lim 2015, and OECD 2008).

¹⁷ After the direct payment's adoption in 1999, the percentage of the farmed area on which qualifying practices were adopted rose from 0.2 percent in 2001 to 12.2 percent in 2009 (OECD 2011). By 2011, organic farming practices had only been adopted on 1.1 percent of farmed land, however (Jeong and Moon 2013 in Lee et al. 2016).] In 2018, the government raised direct payment rates for environmentally-friendly farming (personal communication with Lim 2018).

¹⁸ Korea's organic agricultural products certification standard dates from 2001, when it was introduced alongside two other certifications for pesticide-free and low-pesticide agricultural products. The latter had been phased out by 2015. (OECD 2011)

¹⁹ Three years for pesticide-free farming, and five years for organic.

²⁰ During the period 2001-2005, 191 environmentally-friendly areas were established (OECD 2008).

establish farming operations, including integrated crop-livestock systems, but also to invest in distribution, education, and tourism facilities.

In 2002, the establishment of the Biodiversity Management Contract Scheme allowed local government entities to pay farmers for maintaining animal shelter, feed, or habitat on their fields on a contractual basis. Valid practices include partial rice harvesting, winter barley sowing, winter paddy irrigation, and rice straw supply. In 2016, 24 cities and towns participated in the program supply (Yoo, Yeo, and Kong 2012, OECD 2018).

Fertilizer subsidies were fully phased out by 2015, but the government maintained an “eco-friendly fertilizer” support program in place. The program supports the recycling of agricultural byproducts by paying a fixed subsidy for each bag of fertilizer that meets program criteria. The program also subsumed a different program that has been in place since the 1960s to support farmers improve their soil quality, particularly those farming acidified soils, and more recently, those contaminated with heavy metals. Support is also prioritized for paddyland that is low in silicic acid or rich in volcanic ash. Local government contributes one fifth of the soil improvement subsidy.

Another set of programs supports the distribution and promotion of ecofriendly agricultural products by co-funding a variety of initiatives. One co-funds activities ranging from awareness-raising interventions targeting producer and consumer organizations, to the development of specialized logistics centers and wholesale and retail marketing operations. Another program matches funding for trade-related activities involving ecofriendly agricultural products undertaken by such actors as farmers’ and consumers’ cooperatives, and e-commerce businesses (providing 80 percent of project costs). One program makes concessional loans available to stores specializing in the retail sale of ecofriendly agricultural products. Stores must meet minimum sales and supplier requirements to qualify, and can apply the funds toward opening costs or the purchase of displays, and refrigeration equipment. The government also leverages the public procurement of food for schools, hospitals, and other institutions to guarantee markets for ecofriendly processed foods.

Finally, the 2018–2022 Agriculture, Rural, and Food Industry Development Plan indicates that a new environmental payment program will be introduced on the basis of farmland districts. However, the details are forthcoming (personal communication with Lim 2018).

Annex II: China: agricultural subsidy reform with a focus on efforts to green farm support

Brief history of agricultural support programs

China has a brief history of supporting farmers, and its policy is rapidly evolving (Shields 2016). China only stopped taxing agriculture as a sector in 2003–04, and although agricultural subsidies had been in place prior to that, they became more much significant from that point on. In 2004, China instituted price floors for rice and wheat, a “temporary reserve” for stockpiling corn, soybeans, rapeseed, cotton, and sugar, and direct payments to grain farmers; and in 2008, subsidized agricultural insurance was rolled out nationwide (Shields 2016).

That period was marked by debates about whether agricultural subsidies should support farmer incomes or food security, and ultimately, both objectives were pursued (Du, Sun and Fang 2011). Focused as they were on stimulating food production—especially that of staple grains—farm support programs were part of the broader package of policies that were put in place to ensure food security, which besides farm support included systems for farmland protection, food storage, and food market control. At the same time, farm subsidies were implemented in a way that reflected the volition to support the livelihoods of farmers; and they still do to this day. Indeed, in the 1990s and 2000s, the focus of agricultural policy shifted to focus increasingly on supporting farmers’ incomes, without abandoning the longer-standing objective of increasing the output of staple grains to ensure food security (based on OECD 2017c). The 2004 Number One Central Document was the first of its kind to put forth increasing farmers’ income as a goal of agricultural policy (The State Council of the People’s Republic of China 2004 in OECD 2017c). During this phase, although a few environmental programs were put in place, environmental protection was not a central priority, and may even have been considered inimical to other goals of agricultural policy.

Status as of 2015

By 2015, the Ministry of Agriculture listed some 50 agricultural support programs. Among these, four of these were key.

Within a year of its 2006 implementation, the **general input subsidy for grain producers**—introduced at a time when fuel prices were rising—became the largest agricultural subsidy by far (Figure 6). At first, payments were small and largely decoupled from input prices, but they grew over time (Huang et al. 2011). And in 2015, they were linked to market conditions when authorities put a “dynamic adjustment system” in place to adjust subsidy levels (upward) on the basis of fertilizer, pesticides, diesel, and other input prices (Gale 2013). Nonetheless, Huang et al. (2011) showed that the subsidy had no significant influence over planting or production decisions, functioning as an income transfer program. Although the general input subsidy payment was nominally meant to help farmers cover the cost of inputs and transferred at the beginning of the growing season (Huang et al. 2011), farmers received this subsidy on the basis of their farmed land and not on the basis of their production decisions (such as their use of inputs). This remained the case when the subsidy was tied to input prices, and even after its reform. The other three major subsidies were a direct payment for grain output²¹ (implemented in 2004), a subsidy

²¹ Paid on the basis of the taxed land area and taxed output.

for advanced agricultural machinery²² (introduced in 2004 to respond to the shrinking rural labor force), and one for improved seed varieties²³ covering ten major crops including rice, wheat, and maize (implemented on a pilot basis starting in 2002). Like the general input subsidy, the latter became a kind of rural entitlement program.

Dozens of other smaller subsidies also existed, most of them aimed at improving productivity or addressing farming risk. There were subsidies, among other things, for crop and livestock insurance (launched in 2007), improved livestock breeds (introduced in 2005), standardized livestock farms, livestock immunization and veterinary staff, fishing boats, the construction of “high standard fields,” “standardized” horticultural production areas, and an annual campaign to spray wheat with pesticides (Shields 2016). Several subsidies also supported fertilizer production and use (**Box 8**).

Box 8: Fertilizer subsidies in China

The fertilizer subsidies that China has resorted to over time can be grouped into five categories according to Li et al. 2013: (i) subsidies for electricity use by fertilizer manufacturers, (ii) subsidies for the transportation of fertilizer via exemptions from certain railway fees, (iii) exemptions from value-added tax on fertilizer-related businesses, (iv) concessional finance for firms involved in a fertilizer storage and price stabilization scheme, and (v) input subsidies for farmers (Li et al. 2013). The latter refers to the “General Input Subsidy,” a direct payment to farmers that was in place between 2006 and 2015–16. It bears noting, however, that this subsidy was based on farmed area and not on farmers’ actual use of inputs, and in this sense, was less a fertilizer subsidy than an income support subsidy.

A number of green subsidies were also in place, including ones for soil testing, model farms demonstrating environmentally friendly techniques and “smart” farming, and the protection of grasslands. Starting in 1999, a program known as “Grain for Green,” to mitigate land degradation, paid farmers to convert fragile farmland to forest or pasture.²⁴ To contain desertification, one program established in 2003 paid farmers to convert grazing land to grassland. In 2011, China put in place its Ecological Subsidy and Award System for the Ecological Protection of Grassland. The Soil Organic Matter project (renamed the Farmland Protection and Quality Improvement Project in 2014) provided farmers materials and economic incentives to recycle agricultural residues and build top soil (Yu 2016). To put their importance in perspective, however, the OECD found that less than 1 percent of producer support consisted of payments linked to specific environmental actions by producers in the 2013–15 period (OECD 2017).

Reforms under way

Major reforms of agricultural subsidies, including environmentally-oriented ones, have been in the works since around 2014, when the Number One Central document set a new tone, calling for “reform” where previous ones had emphasized “development,” calling out the importance of food quality in addition to quantity, and the need for developing agriculture sustainably in the long-run. By 2016, China was—and it still is—in the midst of the most extensive agricultural policy reforms since—according to Shields (2016)—

²³ Farmers either receive a direct payment or benefit from discounted retail prices, depending on the province they are in.

²⁴ Starting in 2013, to reduce pollution from animal farming, hog operations were banned from the vicinity of cities, waterways, and roads and subsidies were put in place for farms to build manure treatment and biogas facilities, and to safely dispose of diseased animal carcasses (Gale 2015).

the implementation in 1978–84 of the “household responsibility system,” when the country effectively broke away from the planned economy approach.²⁵

Of particular note, Chinese agricultural policy has increasingly embraced ecological objectives over the past few years. Seemingly, this change has largely come from the top down, and while it cannot be traced to a single pivotal speech, strategy, or legal text, several of these can be held up as signaling a [green] reorientation of policy. The year 2010 is when China officially made sustainable agricultural development a primary policy objective (OECD 2017), a party line that was strongly echoed in 2014, as noted above, when the Number One Central Document called, for the first time, for the establishment of a long-term framework to achieve that objective. That year, China also embraced a new way of thinking about food security that included a role for (“moderate”) imports in meeting that objective, and emphasized the importance of aligning production with domestic resources and natural conditions (State Council of the People’s Republic of China 2014 in OECD 2017c). One year later, in 2015, the State Council issued the Sustainable Agricultural Development Plan (2015–2030) to accelerate the development of resource-saving, environmentally-friendly, and ecosystem-protecting agriculture. That document is meant to steer the sector away from extensive, resource-intensive and environmentally damaging farm management, and toward intensive farming with a focus on quality and efficiency (OECD 2017c). **Box 9** offers more highlights from the Plan.

Box 9: Highlights from China’s Sustainable Agricultural Development Plan, 2015–2030

Released by the Ministry of Agriculture in 2015, China’s Sustainable Agricultural Development Plan lays out the following principles and calls to action for 2015–30, covering the crop, livestock, and aquaculture industries.

Principles • Match environmental carrying capacity with agricultural production. • Promote innovation alongside the enforcement of environmental protection. • Strengthen short-term pollution control measures while promoting long-term measures for sustainable resource utilization. • Scale up successful models through piloting and demonstration. • Use both government guidance and market incentives to promote sustainable production.

Crop Production • Control cropland contamination as it relates to fertilizer and pesticide utilization and to plastic films and packaging. • Move toward a science-based and efficient use of inputs. • Achieve zero growth in fertilizer use by 2020. • Achieve zero growth in pesticide use by 2020. • Achieve the full utilization or recycling of agricultural plastics and pesticide packaging wastes by 2030.

Animal Agriculture • Ensure comprehensive control of pollution from animal production. • Support the standardization of concentrated livestock farms and production zones. • Improve the collection, treatment, and utilization of livestock waste. • Control livestock pollution releases. • Strengthen control of the production and use of veterinary medicines and feed additives. • Control the capacity and density of aquaculture production in coastal areas, rivers, lakes, and reservoirs. • Support the standardization and ecological restoration of aquaculture ponds.

Source: Based on China Ministry of Agriculture et al. (2015) in Cassou et al. (2017).

Today, Chinese officials often point to Chinese President Xu Jinping’s address to the 19th Communist Party Congress in October 2017—emphasizing green growth and circular economy—as marking a turning point (personal communication with Gale 2018). Most recently, even though it actually builds on reforms of previous years, the 2018 Number One Central document is also notable in that it formally calls for a broad reform of the rural development strategy centered on “intensive” and “sustainable green” agriculture. And indeed, the year 2018 has brought another wave of agricultural sector reforms focused namely on environmental protection, large-scale agriculture, so-called “new modes of production,” as well as the “integration of rural primary, secondary, and tertiary industry” (China MoA 2018, Tuliu 2017). These reforms have not eliminated support for small family farms, but steps are being taken to target these better, and to some extent, tie these to greener farmer practices.

Some of the major reorientations of agricultural policy, and especially environmentally-focused ones, that have occurred since 2014 are illustrated next.

Less market distortion

In recent years, the country has moved in the direction of scaling back production- and trade-distorting policies. Between 2014 and 2017, for example, the government (mostly²⁶) abandoned guaranteed minimum prices for cotton, soybeans, corn, and sugar, reflecting—about 15 years after China’s 2001 accession to the WTO—a new strategy of moving toward less market-distorting forms of support by “separating subsidies from prices” (Craymer 2017, Shields 2016). As of 2018, the price floor for rice was also in the process of being reformed, and an unspecified producer subsidy for rice, corn, and soybean was proposed in its place (personal communication with Gale 2018²⁷). This direction is in contrast to that followed between 2008 and 2014, when the minimum purchase prices were continuously raised, boosting grain output but also pushing domestic food prices above international ones and boosting policy-based stocks (OECD 2017). More could be said about these reforms, but they are not the focus of this note.

Environmental protection

Although several agro-environmental subsidy programs predate 2015, several were modified or put in place to lessen the environmental impact of farms that year (Gale 2015). In 2014, for example, the government ramped up its efforts to mitigate land degradation by starting to scale up the long-standing Grain for Green program²⁸ that, as noted above, pays farmers to convert fragile farmland to forest or pasture.

Subsidies were also aligned with new policies on nutrient pollution. In 2015, the government notably adopted a “zero growth” policy for synthetic fertilizer consumption, calling for fertilizer consumption to grow by no more than 1 percent per year between 2015 and 2020, and to stop growing thereafter, thus reinforcing already slowing growth for these products.²⁹³⁰ To accompany these objectives, more money was allocated for soil testing, and a 13 percent value added tax on chemical fertilizer was restored (Gale

²⁷ Also see: http://www.xinhuanet.com/english/2018-04/03/c_137086180.htm.

²⁹ The Zero-Growth Action Plan of Chemical Fertilizers and Pesticides also set a zero growth goal for pesticide consumption.

2015). In 2015, the government also scaled up a program that it renamed the Farmland Protection and Quality Improvement Project, providing materials and economic incentives to encourage farmers to recycle agricultural residues and build top soil (Yu 2016). And under the Agricultural Resources Respite Pilot Policy, the government piloted a mechanism that, among other things, compensated farming households for reducing their use of synthetic fertilizers and increasing their adoption of high-efficiency, low-toxicity and low-residue pesticides (China MoA 2015 in Yu 2016).³¹

Reducing excessive fertilizer use was also among the reasons given for overhauling three of the four major subsidy programs discussed previously, first on a pilot basis in 2015, and then nationally in 2016 (Shields 2016).³² Under the new scheme, the general input subsidy, direct payments for grains, and the improved seed subsidy were merged into the Protective Agricultural Subsidy (China MoA 2017). The stated aim of this reform was both to “protect farmland productivity” and to “support appropriate food production scale.” The majority of these subsidy funds (about 80 percent) were and still are supposed to be allocated to grain farmers on condition that they maintain soil fertility (the “cultivated land fertility protection subsidy”) (Tuli 2016). That said, in practice, payments have reportedly not been made conditional on farmers adopting soil protection measures to date (personal communication with Gale 2018). Nonetheless, the Ministry of Agriculture announced in 2018 that the target of zero growth in fertilizer was achieved two years ahead of schedule (conversation with Fred Gale).

In 2018, environmental protection is mentioned in nearly all of the agricultural policies that were announced for the year in a document issued by the Ministry of Agriculture, (hereafter referred to as “the 2018 document” (MoA 2018).³³ For example, the subsidy for machinery explicitly prioritizes a range of green farming techniques including no-till planting, high-efficiency pesticides, water-saving irrigation, stalk and straw recycling (removal or return to soil), plastic film recovery, manure utilization, and province-specific ones. A section of the 2018 document on support for “new-type agricultural operators” discussed below includes several references to these business-oriented farming actors playing a role in greening agriculture. Meanwhile, the embrace of “environmentally friendly modern agriculture” is seen as being part of the plan to develop regional brands and products, also discussed below.

Environmental protection is also the *primary* objective of several agricultural support programs. One of these will presumably pay or otherwise economically incentivize³⁴ farmers to fallow their land or take up land rotation—expanding existing pilot programs. (This program is under the chapter on “agricultural structural adjustment.”) The 2018 document also devotes an entire section to programs supporting the protection of ecological resources and the prevention of nonpoint source pollution. This section foresees several pilot programs, including one to address the problem of plastic mulch pollution (with collection and recycling and better quality film), the overexploitation of groundwater (with water-saving measures), the contamination of soils with heavy metals (including with land retirement), the loss of soil organic matter (with measures to build and protect it), excessive use of synthetic fertilizer (with organic fertilizer

³¹ This program also included measures to address heavy metal contamination of agricultural soils, and various forms of nonpoint source pollution from livestock, aquaculture, and crop farms.

substitution), livestock waste pollution (with improved treatment and reutilization), as well as overfishing and overgrazing.

Finally, a section on supporting “green, high-efficiency technology extension services” is heavily focused on developing extension services that are at the service of environmental protection. The document foresees support for the demonstration and diffusion of “green, high-yielding, high-efficiency technology,” to produce greener, higher quality products. The intent is to focus on rice, wheat, and corn, but also to improve (and presumably green) the production of tubers, soybeans, minor grains and beans, cotton, oilseeds, sugar, fruits, vegetables, and tea. Other programs are meant to support the development and adoption of improved livestock breeds, agricultural machinery for subsoil cultivation, grassroots extension models, and more.

Farm consolidation, intensification, and modernization

Another direction of subsidy reforms in recent years has been to accelerate farm consolidation and modernization. To this end, one approach has been to develop and support a new class of professional agricultural actors, while another has been to support the integration and upgrading of agricultural value chains.

One of the stated grounds for reforming the “three subsidies” in 2015–16 included the desire to support farm consolidation and scaled-up farms and the emergence of new types of farming businesses, while continuing to support the income of small grain farmers in a more targeted way.³⁵ And part of the “agricultural support protection” package that replaced the three subsidies (roughly 20 percent) is now targeted to larger-scale grain producers and “new types of farming businesses” that are adding diversity to farming products as well as to farming business models.³⁶ Recipients of these subsidies may include large family farms, corporate farms, professional farming cooperatives, and what are referred to as “socialized” farming services. The latter seem to refer to businesses offering various farming services such as professional pest management, turnkey farm management, advisory services, and equipment rental. The unifying characteristic of these “new” actors seems to be that they approach farming as a business.³⁷

In the same vein, an entire section of the agricultural policies announced by the Ministry of Agriculture for 2018 (the “2018 document”) was devoted to “developing new-type agricultural operators.” These operators are central to a vision in which “professional farming systems” will “lead everyone else.” To move in this direction, the government called for training 1 million farming professionals, including “modern young farm operators, professional agricultural managers, agricultural socialized services, and subjects of agricultural industrialized anti-poverty programs.”

Other instruments laid out to support new types of actors in the 2018 document include the public procurement of services, as well as capacity building and credit for “capable” farmer cooperatives, specialized technical associations, agricultural dragon head companies, and other operators involved in

³⁵ The Ministries of Agriculture and Finance, in 2016, called for the subsidy reform to “further increase the accuracy, targeting, and effectiveness of the agricultural subsidy, promote the sustainable development of agriculture, increase the agricultural modernization process, and realize the vision of ‘strong agriculture, rich farmer and beautiful village.’”

³⁶ The nature of these subsidies is unspecified in high level policy documents. Subsidies are supposed to pay for example for improvements on farms, like grain storage facilities, grain drying equipment, and other on-farm facilities (personal communication with Gale 2018).

³⁷ Support for these farming businesses is also given in the form of training, guaranteed markets (through public procurement), and preferential land use policies, taxation, and credit.

training farmers at large. Capacity building can for example cover green and ecological agriculture, production standards, processing, and marketing. Meanwhile, to unlock and speed up credit, the 2018 document calls for a national agricultural credit guarantee system to be established. It is meant to not only support grain production, but also livestock farming and aquaculture, “specialty industries,” “new rural businesses,” and “rural primary-secondary-tertiary integration” initiatives (to construct high quality fields, adopt advanced machinery and equipment, and meet green production standards).

A full section of the 2018 document is about the continued “integration of rural industry,” a reference to the now popular concept of integrating “rural primary, secondary, and tertiary industry.” To advance the integration and upgrading of value chains—which seems to be the crux of this idea—the government foresees continued support for existing and new “modern agricultural industrial parks,” guided by province-level recommendations. It also calls for supporting the development of “village industries,” specialty product value chains, agricultural tourism and multifunctional agriculture more generally, “intelligent” agriculture (a possible reference to the use of ICT in agriculture), and agricultural industrialization, with investments in things like processing, packaging, information platforms, e-commerce, and other marketing infrastructure or capacity.

Yet another section of the 2018 document is devoted to the idea of “structural adjustment” and this covers a variety of topics, from encouraging land fallowing and crop rotation, to expanding the production of fodder for dairy cattle, and developing “local specialty agriculture.” The latter foresees the nurturing of regional brands as well as regional companies and products, with a focus on food safety, efficiency, resource conservation, and environmental protection.

Improved targeting of grain farmers

While the 2016 reform of the three subsidies set aside funds to support new types of farm sector businesses, including large, intensive farming operations, the subsidy still reserved the bulk of payments for family farms, which are mostly small farms. In fact, the reform refocused these payments on active grain farmers, by (at least nominally) excluding abandoned or converted arable land, and even land used to grow specialty crops and animals (which may be seen as more lucrative farming activities) (Tuliu 2017). Subsidies are also being adjusted to be given to tillers instead of holders of contracted land (personal communication with Gale 2018).³⁸

Since at least 2009, direct monetary subsidies have been paid to farmers via electronic funds transfer (DTB Associates 2014). Payments are made by county-level Financial Bureaus to farmers’ personal accounts with local banks or credit cooperatives. This system was presumably put in place to facilitate the administration of the many different subsidy programs available to farmers, presumably cutting its cost and reducing fraud. Farmers can reportedly receive on the order of a dozen payments in a given year (conversation with Fred Gale). This system is credited by some observers with having limited opportunities for embezzlement, a problem that reportedly existed when payments were made in cash.

³⁸ Huang et al. (2011) found that most subsidies were being given to those contracting the land, and not necessarily those tilling it.

Annex III: EU Common Agricultural Policy reform: the greening of farm income support

Brief history of the Common Agricultural Policy's objectives and instruments

The Common Agricultural Policy (CAP), one of the longest standing policies of the European Union,³⁹ originated in response to post-World War II concern for food security (EC 2012, EC n.d.). At the time, agriculture had been crippled by conflict and adequate food supplies could not be guaranteed, and the CAP's first purpose was to ensure the European public's access to a stable supply of affordable food. Over time, through a series of reforms, the CAP came to focus increasingly on ensuring a certain standard of living for farmers and agricultural workers. That goal—unlike the ones relating to food quality and safety, rural development, animal welfare, and environmental protection, which were to come later—was nominally present from the start (**Box 10**). Today, the goals of European agricultural policy have markedly evolved, the CAP's broad objectives being viable food production, sustainable management of natural resources and climate action, and balanced territorial development (Regulation [EU] No 1306/2013).⁴⁰

Box 10: Evolution of the CAP's objectives: from food security to green growth

The Treaty of Rome of 1957 laid the groundwork for the early CAP by laying out the main objectives of European agricultural policy. These were to:

- a. increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilization of the factors of production, in particular labor; thus
- b. to ensure a fair standard of living for the agricultural community in particular by increasing the individual earnings of persons engaged in agriculture;
- c. stabilize markets;
- d. ensure the availability of supplies;
- e. ensure that supplies reach consumers at reasonable prices.

Since 2013, the CAP's performance has been measured against the following broad objectives (as laid out in Regulation [EU] No 1306/2013):

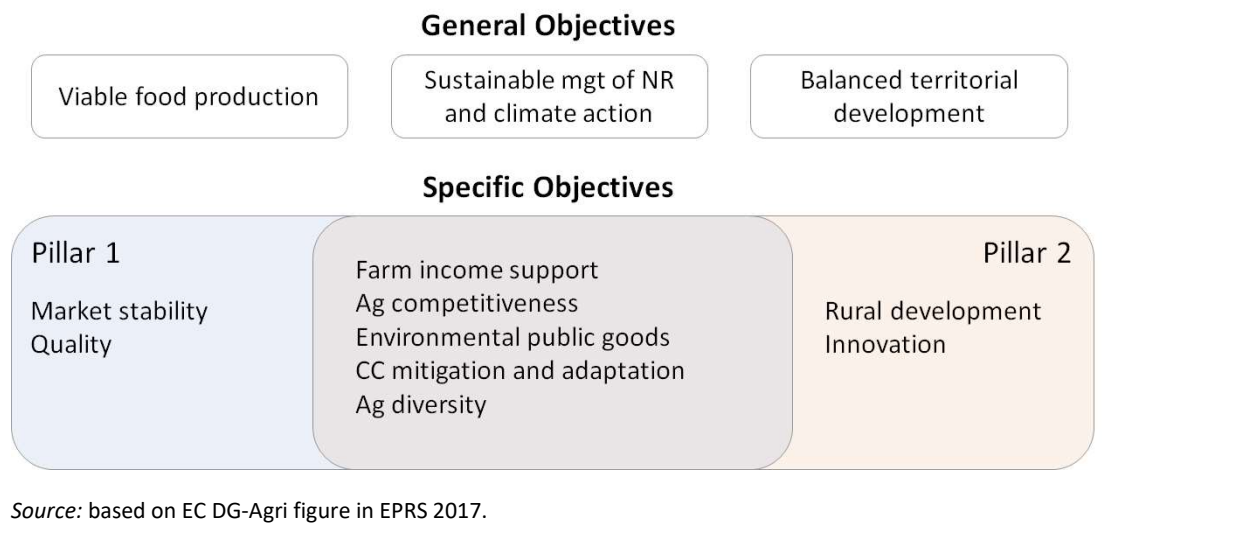
- a. viable food production, with a focus on agricultural income, agricultural productivity and price stability
- b. management of natural resources and climate action, with a focus on greenhouse gas emissions, biodiversity, soil and water
- c. balanced territorial development, with a focus on rural employment, growth and poverty in rural areas.

Figure 9 outlines the broad and specific objectives of today's CAP.

³⁹ The EU and its predecessor communities

⁴⁰ As Reichert (2006) notes: "The objectives of the CAP were not replaced, but rather extended to include social objectives such as consumer and environmental protection, the support of rural areas and coherency with development policy."

Figure 9: Broad and specific objectives of the 2014–2020 Common Agricultural Policy: “smart, sustainable, and inclusive growth”



When it was first put in place in 1962, governed as it was by food security concerns, the CAP set out to modernize farming and ramp up production. In this endeavor, price support became its instrument of choice. Guaranteed minimum prices—backed by commodity market interventions and barriers to trade—became the cornerstone of early European agricultural policy (EC DG-Agri 2011) (**Box 11**). The CAP helped farms modernize by directly and indirectly subsidizing better farming facilities, equipment, and inputs. In the 1970s, these policies were complemented by measures designed to accelerate farm consolidation (helping farmers withdraw from agriculture).

Box 11: The CAP’s early years: they system of price support

Under the CAP, commodity-specific organizations⁴¹ were created and intervened in markets to ensure both price stability as well as to defend target, minimum wholesale prices for agricultural products. Interventions depended on the commodity and circumstances, but essentially consisted of intervention buying (with storage or destruction), import tariffs and restrictions, and export subsidies (bridging the gap between world market and EU target prices) (Matthews, Salvatici, and Scoppola 2017, EC DG-Agri 2011). Other modes of intervention included aid for private storage, consumer subsidies, and deficiency payments (covering the gap between market and target prices) (Matthews n.d.). Starting in the 1980s, production quotas were also used to shore up surpluses of sugar and later dairy (they were abolished in 2017 and 2015 respectively) (Eurostat 2017a, EC DG-Agri 2011).

From the perspective of today’s middle-income countries, it is interesting to put the CAP’s early policy directions in perspective and in their historical context—especially to explain its choice of instruments in pursuing these objectives. At the time of the CAP’s inception during the post-war period, consumers were used to paying high prices for food, and economic growth was high. One interpretation is that these circumstances made a price support system—the cost of which is borne by consumers in the form of higher food prices—more politically palatable than deficiency payments or other direct payments to farmers—the cost of which is borne by taxpayers, and which would have put pressure on the fiscal budgets of the then six member countries (Zobbe 2001).

⁴¹ Market management entities were established for commodities including pig meat, poultry meat, sheep and goat meat, beef and veal, eggs, milk and dairy products, fruit and vegetables, rice, cereals, wine, sugar, and others—there were 21 commodity market organizations as of 2007 (Council Regulation [EC] No 1234/2007).

The CAP was so successful at boosting farm production that by the 1980s, the EU was generating permanent surpluses of food—referred to as “food mountains”—that had to be either exported,⁴² stored, or destroyed. The cost to consumers and taxpayers (and EU budgets) of these surpluses however—not to mention their price-distorting effects in international markets—ultimately led CAP policies to grow unpopular among large portions of the public. Even certain farmers whose interests were not being served by CAP policies grew opposed (EC n.d.). Since, reforms have sought to bring about a greater market orientation of agriculture while pursuing various economic, social and environmental objectives.

The reform of 1993 was significant because the CAP shifted from supporting products, through prices, to supporting producers—their incomes—through direct payments. At first, payments were determined on the basis of production (output). Ten years later, in 2003 (effective 2005), those payments were mostly⁴³ “decoupled” from production—that is, made independent from output—under the single payment scheme, which paid active farmers on the basis of land holdings.⁴⁴ Market intervention became a safety net tool for times of crisis,⁴⁵ and direct payments the main form of farm support (both under the CAP’s pillar 1, see Box 12). Indicatively, whereas market management measures spoke for over 90 percent of CAP expenditures in 1992—mostly in the form of export refunds and intervention purchases—they accounted for only 5 percent by the end of 2013 (EC 2013a).

The rise of environmental sustainability

During the 1990s, steps were taken to put environmental goals on the agricultural agenda. In 1992, the year the Rio Earth Summit elevated the concept of sustainable development, the EU made it a requirement that member states introduce agri-environment measures throughout their territory. As Figure 10 shows, spending on agri-environmental measures quickly increased at this point. Later in the decade (in 1999), the European Commission’s Agenda 2000, which established the CAP’s second pillar, embraced social and environmental goals as part of the CAP’s (EC DG-Agri 2005).⁴⁶ Together with fostering agricultural competitiveness and achieving balanced territorial development, ensuring the sustainable management of natural resources and climate action⁴⁷ was established as one of the overarching objectives of rural development policy (European Parliament 2018). Still, these steps were markedly less bold than those to come.

⁴² In this case, export refunds were paid to bridge the gap between EU and world market prices.

⁴³ Member States retained the right to maintain certain coupled payments in place—and they still do. Some countries use them in the ruminant livestock sector for example (OECD 2017a). The objective for budget year 2017 was close to 90 percent decoupling (EC DG-Agri 2017).

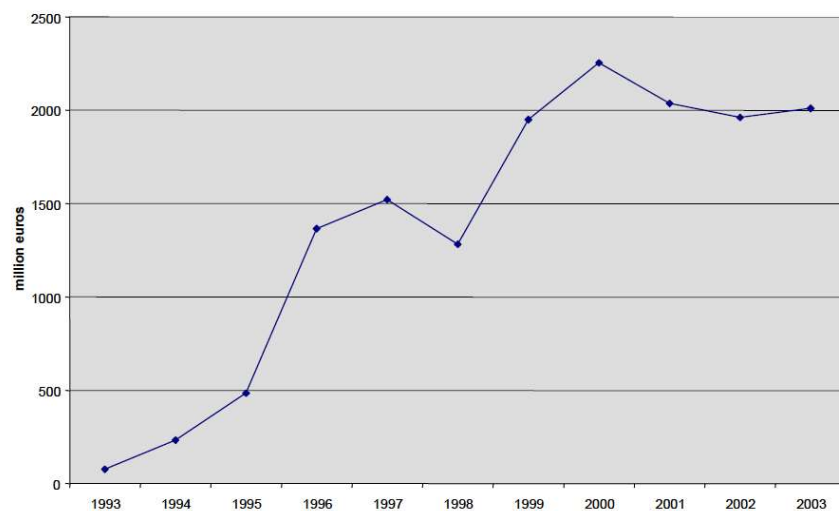
⁴⁴ Although the single payment was replaced by the basic payment scheme in 2013 (effective 2015), acreage remains the primary basis for income support to this day.

⁴⁵ For example, intervention prices are set at levels that ensure they are used only in times of real price crisis and when there is a risk of market disruption (EC DG-Agri 2011).

⁴⁶ And as part of the Agenda 2000 CAP reform, provisions of the aforementioned agri-environment regulation of 1992 (Council Regulation (EEC) No 2078/92) were incorporated into the Rural Development Regulation.

⁴⁷ Related priorities of regional development were to (1) restore, preserve and enhance ecosystems dependent on agriculture and forestry; and (2) promote resource efficiency and support the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors.

Figure 10: EU budget spending on agri-environment, 1993–03



Source: EC DG-Agri 2005.

The CAP reform of 2003 brought a more significant pivot toward environmental objectives, linking the bulk of CAP spending to environmental protection. After 2003, under the system known as cross-compliance, direct payments (under pillar 1)⁴⁸ became conditional on (most⁴⁹) farmers’ compliance with laws and regulations establishing environmental, food safety, and animal welfare standards relating to agricultural land, production, and activity. In other words, income support subsidies became farmers’ to lose by not complying with environmental and other mandates. Subsidies for agri-environment and climate (AEC) measures, and other environmental subsidies under the CAP’s rural development programs (under pillar 2) were already farmers’ to gain by voluntarily going above and beyond these requirements and adopting any number of pre-established land management practices.⁵⁰

With the 2013 reform, the CAP’s environmental orientation only deepened. The introduction of green direct (“greening”) payments upped the requirements for accessing income support by making at least 30 percent of direct payments to farmers⁵¹—on the order of USD 14 billion (12 billion euros) (Figure 11)—conditional on the adoption of designated agricultural practices deemed beneficial to the climate and the environment (effective from 2015). The reform of 2013 also directed at least 30 percent of expenditures on rural development programs (under pillar 2) to support voluntary environmental⁵² measures (Regulation (EU) No 1305/2013).⁵³ The latter can be supported via several instruments: agri-environment and climate payments, organic farming payments, forest conservation payments, payments for sustainable farming in areas facing natural constraints, payments for the maintenance of ecologically

⁴⁸ The 2003 reform replaced more than 10 subsidy schemes with the single payment scheme (SPS). The single payment scheme was replaced by the basic payment scheme (BPS) after the reform of 2013 (effective 2015). The BPS payment is complemented by smaller payments, including ones for “greening,” young farmers, small farms, farms facing natural constraints (e.g., farming in mountainous areas), and protein rich crops, and in most countries (not Germany), voluntary coupled support (VCS). Since 2014, VCS has accounted for an average of 10 percent of direct payments in countries using them (OECD 2017).

⁴⁹ Cross-compliance requirements are waived for farms below a certain size.

⁵⁰ These voluntary measures do not exempt farmers from complying with cross-compliance standards.

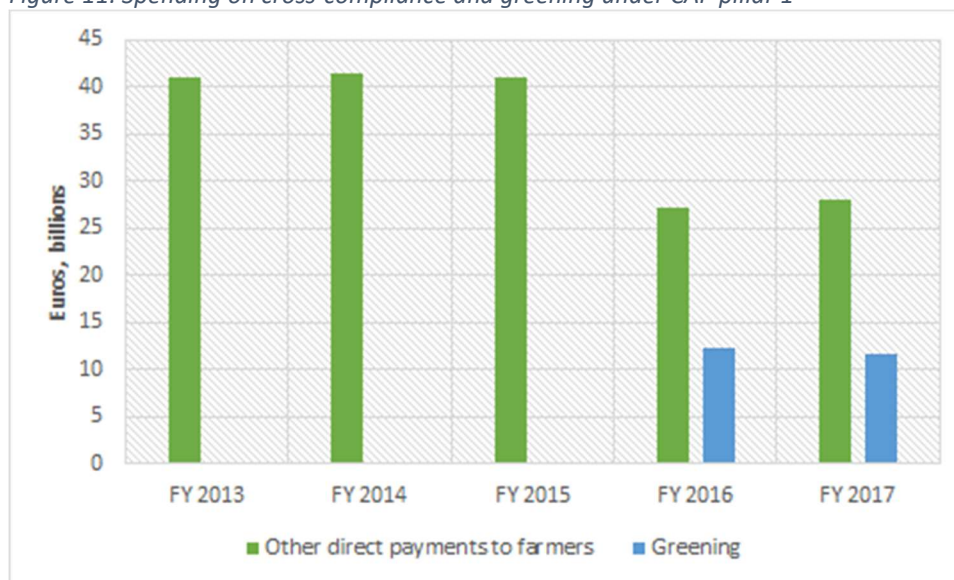
⁵¹ at least 30 percent of members states’ annual ceilings for direct payments

⁵² including climate adaptation and mitigation measures

⁵³ Between 2007 and 2013, the minimum expenditure on measures deemed to improve the environment and the countryside was fixed at 25 percent (OECD 2017).

sensitive areas protected under the Natura 2000 and Water Directives, and environment-related investment support. More details on the requirements and applicability of these environmental provisions are provided below.

Figure 11: Spending on cross-compliance and greening under CAP pillar 1



Source: European Commission data (eur-lex.europa.eu/budget/www/index-en.htm).

Box 12: Two pillars and three major agri-environmental subsidies

Since the Agenda 2000 reform, the CAP has rested on two main pillars. The first encompasses both income support and “market measures” that protect producers from price and weather risk, the latter being the smaller component.⁵⁴ Rural development is the CAP’s second pillar and a response to “territorial” challenges relating to the social and economic difficulties that have followed the loss of population and businesses in certain rural areas.⁵⁵ Unlike the first pillar, which is entirely financed by the EU, programs under the second pillar are also (15–50 percent) financed by national funds.

As discussed in more detail below, the three main agri-environmental subsidies under these pillars are, under pillar 1, (1) direct payments subject to environmental cross-compliance (since 2003), and (2) greening payments (since 2013); and under pillar 2, (3) agri-environment and climate payments (since the 1990s) and other environmental payments under the rural development programs. Under the system of cross-compliance established in 2003, compliance with agri-environmental laws and regulations is the minimum condition for accessing all three subsidies. Greening payments require

⁵⁴ In recent years, market measures have been used in cases of crisis and accounted for, on average, 5 percent of farm spending (EC 2013a).

⁵⁵ Rural development programs (RDPs) under the CAP’s second pillar finance individual projects on farms and other activities in rural areas on the basis of economic, environmental, and territorial priorities. For example, they fund installation grants for young farmers, agri-environment and climate measures, organic conversion and farming, agro-tourism, and broadband internet coverage in rural areas (EC 2017a). These subsidies account for almost one quarter of the CAP budget, and are co-financed by national and other public and private entities.

farmers to adopt mandated land management practices, and agri-environment and climate payments are accessible to farmers who adopt practices that go above and beyond what is required.

Details on cross compliance, green direct payments, and regional development program payments⁵⁶

Cross-compliance

Under the cross-compliance system,⁵⁷ farmers must meet two broad sets of requirements in order to qualify for direct payments: statutory management requirements (SMRs), and good agricultural and environmental condition (GAEC) standards. SMRs refer to some 18 legal texts (EU directives and regulations) relating to the environment, food safety, animal and plant health, and animal welfare (OECD 2017a). GAEC standards define minimum land management practices relating to soil quality and erosion, water quality, and wildlife habitat (**Box 13**).

Box 13: Cross-compliance requirements: SMRs and GAEC standards

Statutory management requirements (SMRs) include:

- Environmental protection: Nitrates Directive, NATURA 2000 Directives (wild birds and habitats)
- Public, animal and plant health: General Food Law, Hormones Ban Directive, Regulations on the identification and registration of pigs, bovine, ovine and caprine animals, Regulation on prevention, control and eradication of TSE, Regulation on plant protection products
- Animal welfare: Directives on the protection of calves, pigs and other farmed animals.

Good agricultural and environmental conditions (GAEC) standards differ by country and account for Europe's heterogeneous agroecological conditions and farming systems (land use, crop rotation, farming practices). They prescribe measures to:⁵⁸

- Prevent soil erosion: minimum soil cover, minimum land management
- Maintain soil organic matter and soil structure: maintenance of soil organic matter level
- Protect and manage water: establishment of buffer strips along water courses, authorization to use water for irrigation and protection of ground water against pollution
- Protect wildlife habitat and biodiversity: retention of landscape features including ban on cutting hedges and trees during the bird breeding and rearing season.

(Source: Based on EC DG-Agri n.d.)

Member states are required to verify farmers' eligibility and cross-compliance on a yearly basis, including through the use of remote sensing and ground-truthing.⁵⁹ Direct payments are administered through

⁵⁶ Details are based on EU regulations, unless otherwise specified.

⁵⁷ Established by Council Regulation (EC) No 1782/2003, no longer in force; governed by Regulation (EU) No 1306/2013.

⁵⁸ These go beyond legislative requirements (OECD 2017a).

⁵⁹ 5 percent of applicants will be selected for land eligibility inspection under all schemes covered by the application form (Ireland DAFM 2017).

member states' "integrated administration and control systems," which identify farmers along with their agricultural parcels, aid applications, and payments. To receive direct payments, farmers are required to submit an application indicating, among other things, their agricultural land holdings, and the number and amount of payments they are entitled to.

Failure to comply with cross-compliance requirements can cost farmers 20–100 percent of their direct payments and the exclusion for one or more years from various aid programs if it is intentional, and 5–15 percent if it is out of negligence. An administrative penalty also applies. However, farmers participating in the small farmers' scheme are exempt from the CAP's control system and the risk of cross-compliance penalties—although they are not exempt from the relevant (environmental and other) laws.⁶⁰ This exemption is meant to spare small farms the administrative burden associated with cross-compliance.

To accompany farmers in cross-compliance, the CAP requires member states to offer them comprehensive advisory services. The farm advisory system (FAS), participation in which is voluntary, is meant to help commercial farms "become more aware of material flows and on-farm processes relating to the environment, food safety, animal health and welfare." The last reform of the CAP enlarged the scope of the FAS (EC DG-Agri n.d.a) to cover land management practices and conditions for receiving the greening payments and exceeding legal requirements relating to the management of water and pesticides (European Commission). The system prioritizes farms receiving above a certain amount in direct payments per year.

Payments are paid annually, and determined on the basis of eligible hectares: "agricultural area of the holding taken up by arable land and permanent pasture except areas under permanent crops, forests or used for non-agricultural activities" (Box 14). EU law specifies that direct payments are specifically not conditional on farmers growing any specific product. However, certain products, such as protein-rich crops (peas, beans, lupins) and rice in traditional production areas, are entitled to larger payments (Ireland DAFM 2017).

Box 14: Eligibility for direct payments

Only farmers with a holding located in the EU and exercising an agricultural activity can receive direct payments. The land must be used and managed by the applicant. If the applicant is not the owner of the land, he or she must have a lease or rental agreement in place with the owner of the land and available at the time of inspection. The requirement of being an "active" farmer means that individuals and companies such as airports, real estate services and sport grounds who may have agricultural land at their disposal but who have no or only a very marginal agricultural activity cannot receive support from the CAP.

In order to be eligible for payment each land parcel must have an agricultural activity carried out on it. As a general rule, only land suitable for agricultural production is considered to be agricultural area (forests are in principle not eligible). Agricultural areas include arable land, permanent crops and permanent grassland. But it is not enough to simply own or have agricultural land at their disposal: farmers must also show that this land is used for some form of agricultural activity. In general, this means the rearing of animals or growing of agricultural products (for harvesting, milking, breeding, and

⁶⁰ Generally, direct payments are not granted to a farmer if the total amount due or the area of land eligible for payment is too small. The exact threshold varies from country to country as it is set by national administrations, but it is generally between €100 and €500 (~USD 115–585) and/or 0.3 ha to 5 ha respectively (EC 2016b).

so forth). Alternatively, farmers must ensure that the land is maintained in good agricultural condition, that is, in a condition suitable for grazing or cultivation.

(Based on EC 2017a.)

Greening payments

Greening payments⁶¹ are a subset of direct payments that are conditional on three general conditions (in addition to those of cross-compliance): crop diversification, the establishment and upkeep of ecological focus areas, and the maintenance of permanent grasslands (Box 15). These qualifying measures can be supplemented or substituted by more demanding ones supported by agri-environment and climate payments under rural development programs, discussed next (EC 2016a).

The EU spends a considerable amount on greening payments: about USD 14 billion (12 billion euros) per year, corresponding to 30 percent of all CAP direct payments and almost 8 percent of the entire EU budget. For farmers, this translates into an average of around USD 94 (80 euros) per hectare for the year 2015 (received in 2016) (ECA 2017).

Box 15: The three greening requirements

Crop diversification requires farms with more than 10 hectares of arable land to grow at least two crops, where the main crop cannot cover more than 75 percent of the arable land. Farms with more than 30 hectares (these cover more than 60 percent of the EU's arable land [OECD 2017]) must grow at least three crops, and the main two crops cannot cover more than 95 percent of the land. Exemptions apply, for example, for farms where plants are immersed in water for a significant part of the year, or where more than three quarters of the land are growing grass or forage, or fallowed. A number of substitutions are also allowed. For example, farmers can meet diversification requirements by growing catch crops⁶² or a winter soil cover, by growing more than three crops, or by practicing crop rotations under certain conditions (OECD 2017 + legislation).

Farms with above 15 hectares of arable land must manage at least 5 percent of that area as an **ecological focus area (EFA)**.⁶³ Farmers have the choice to let that land lie fallow; to use the land to build terraces, buffer strips or other qualifying landscape features (like hedgerows, ditches, and archaeological sites); to plant catch crops, green covers, or (untreated) nitrogen-fixing crops; to practice agroforestry or short-rotation coppicing⁶⁴ without the use of synthetic fertilizers or pesticides; or to count afforested land and strips of land bordering forest.⁶⁵ Provisions are in place to allow and even encourage farmers to meet EFA requirements as a group and create contiguous EFAs.⁶⁶ EFA requirements apply to about 4.5 percent of the EU's arable land (OECD 2017).

⁶¹ Governed by Regulation (EU) No 1307/2013.

⁶² A catch crop is a fast-growing crop that is grown between successive plantings of a main crop.

⁶³ That percentage could theoretically rise to 7 percent.

⁶⁴ In the context of a woodland, periodically cutting back vegetation to stimulate growth and provide firewood or timber.

⁶⁵ The most popular EFA features include nitrogen-fixing crops, fallowing, landscape features, short-rotation coppicing, green covers and catch crops (OECD 2017a).

⁶⁶ Still, each farm cannot displace more than 50 percent of their EFA obligation to another holding.

A third greening requirement is to maintain the ratio of **permanent grassland** to agricultural land at no less than 5 percent below its historical level.⁶⁷ EU-wide, permanent grassland occupies more than one third of farmland. Member States are left to determine at what territorial level that ratio applies; in other words, it may or may not be defined as a farm-level requirement. Farmers, however, are not allowed to plough or convert the roughly 20 percent of the grassland area that is designated as sensitive⁶⁸ (EC 2017a). And if the overall ratio is not maintained, the converted land must be converted back to permanent grassland or the ratio otherwise restored. In 2016 the share of farmland belonging to holdings under at least one greening obligation stood at 77 percent (EC 2017b)—which does not imply that greening requirements imposed actual changes in how that land was managed (see more on greening in perspective below).

To ensure compliance with greening requirements, EU governments are required to carry out eligibility and compliance checks using a range of methods including remote sensing and on-the-spot checks. For example, they are required to inspect 10 percent of EFA applicants, 5 percent of applicants carrying out other greening practices, and 3 percent of beneficiaries who claim to be exempted from greening practices (Ireland DAFM 2017).

Like other direct payments, greening payments are proportionate to eligible land holdings (Ireland DAFM 2017). That means that payments are neither related to expected environmental benefits, nor to the costs to farms of adopting environmental measures in terms of either foregone income or additional expenditures. Greening payments accounted for 31 percent of direct payments, and 36 percent of decoupled direct payments in 2016 (OECD 2017a). Agricultural land covered by at least one greening obligation accounted for 73 percent of the EU's utilized agricultural area, and affected 37 percent of direct payment beneficiaries, or 2.4 million farmers in 2015 (EC DG-Agri 2018).

Farms that fail to meet greening requirements can lose up to 100 percent of their greening payments and be subject to additional penalties (of up to 25 percent of the lost payment [EC 2013b]). The maximum percentage farmers could lose ramped up gradually during the first five years of the greening program. Farms participating in the smaller farmers' scheme however (these farms cover about 5 percent of the EU's arable land in 2016), as well as organic farms and those under permanent crops (about 6.7 percent of the EU's agricultural area in 2016), are exempt from meeting greening conditions (OECD 2017a, Eurostat 2017b).

Agri-environment and climate payments and other environmental subsidies under the rural development programs

Agri-environment and climate (AEC) payments⁶⁹ and others financed by the CAP's rural development programs (RDPs) cover farm activities that go above and beyond applicable mandates as laid out in environmental laws and regulations, including those subject to cross-compliance, and where applicable, the CAP's greening requirements. They are intended to help farmers cover the costs of "introducing or continuing to apply agricultural practices that contribute to climate change mitigation and adaptation and

⁶⁷ This ratio is defined as no less than 95 percent of the reference level combining permanent pastures declared in 2012 and additional permanent grassland declared in 2015.

⁶⁸ Including but not limited to areas covered by the Natura 2000 Directive.

⁶⁹ Governed by Regulation (EU) No 1305/2013.

that are compatible with the protection and improvement of the environment, the landscape and its features, natural resources, and the soil and genetic diversity.” And they give special attention to “the conservation of genetic resources in agriculture and the additional needs of farming systems that are of high nature value” (Regulation (EU) No 1305/2013, paragraph 22).

As the rural development programs (RDPs) governing many agri-environmental payments are developed at the national level (subject to EU approval), there is no uniform set of measures applicable across the EU. That said, examples of measures covered by RDPs include ones relating to afforestation and the creation of woodland, the preservation of certain landscape features such as hedgerows, ditches, and woods, the conversion to and practice of organic agriculture and integrated farm management, and the conservation of high-value habitat (EC DG-Agri n.d.b).

To benefit from annual AEC and certain other payments, farmers, farmers’ groups and other land managers must make a “commitment,” and may be required to participate in training. Commitments typically have a duration of five to seven years, though they can be longer (or shorter in the case of conversion to organic farming). In contrast to direct payments and other agri-environmental payments under RDPs,⁷⁰ which pay farmers on the basis of their eligible land holdings, agri-environment and climate (AEC) and organic farming payments typically compensate farmers for all or part of the cost of environmental measures—in terms of foregone income and expenditures, and sometimes even some transaction costs.

The greening of CAP in perspective: effectiveness and political economy

Findings from an audit of greening payments

A 2017 review of the CAP’s greening program by the European Court of Auditors came to rather critical conclusions. As an income support program, the program was deemed complex, and as an environmental one, largely ineffective.

Although the explicit objective of greening payments is to reward farmers for the public environmental goods and services they provide, their function as an income support program is implicit in their classification as a payment program under the CAP’s pillar 1. Given that greening is not the only income support program under the CAP—direct payments subject to cross-compliance being the largest of these (the Basic Payment Scheme)—it can be seen as duplicative with respect to this policy objective, and hence, as saddling this portion of the CAP with unnecessary administrative and other transaction costs, although the EU has made efforts to address these within the existing program structure. This is particularly regrettable when one considers that the program makes very limited contributions to environmental protection, the explicit objective of the program.

Indeed, the report concludes that the greening program is unlikely to provide significant benefits for the environment and climate. Greening has led to a very limited amount of change in farming practices, as most participating farms did not need to make any changes to existing farm management practices to meet greening requirements when it was implemented. In other words, the greening requirements set a very low bar with respect to agri-environmental action, and is not designed to ensure “additionality.”

⁷⁰ that is, Natura 2000 and Water Framework Directive payments, payments to areas facing natural or other specific constraints, and payments for forest conservation.

One study found that 86 percent of farmland (“utilized agricultural area”) representing 55 percent of all farms in the EU-27 was subject to CAP greening requirements, but that only 4.5 percent of farmland had to be reallocated as a result of greening requirements (Louhichi et al. 2017).⁷¹ And among those farms affected, modeling showed that more than two-thirds incurred compliance costs equivalent to less than USD 29 (~25 euros) per hectare, and 40 percent below USD 12 (~10 euros) (Louhichi et al. 2017 in ECA 2017). Another study found that greening requirements may have actually increased farmers’ income by around 1 percent by inducing a decrease in production and thus leading to slightly higher prices (Gocht et al. 2016 in ECA 2017).

The European Court of Auditors (2017) notes missed opportunities to steer farmers toward more environmentally beneficial practices. For example, a crop rotation requirement would have yielded higher environmental returns (especially in terms of soil health) than one of crop diversification, by ensuring that different crops are grown on a given piece of land over time. (Crop rotation would have been more complicated to monitor under an annual payment program, however.) The review also sees the ecological focus areas requirement as a lost opportunity to protect biodiversity, to the extent that it allows farmers to maintain a number of agricultural production activities. A little over half of EFAs take advantage of this and maintain mainly nitrogen-fixing crops and catch crops even though they offer no significant biodiversity benefits (such benefits being the purpose of EFAs). The report also notes that Member States have tended not to use the program’s flexibility to make its requirements more meaningful from an environmental perspective. For example, few member states have used the option to require EFAs to be managed in ways that would make them more beneficial for biodiversity (by limiting the use of pesticides for instance). Several other limitations are pointed out, including overlap in the CAP’s different environmental programs (cross-compliance, greening, and agri-environment and climate measures).

The audit points to a number of shortcomings in how the program was designed. One is that the program did not establish clear and quantified targets for the program’s contributions to specific environmental objectives. The absence of such targets left room for the European Commission’s more ambitious initial proposal, which included stricter requirements and fewer exemptions, to be watered down when the legislation was being drafted. For example, EFAs were initially defined to preclude their use for production, and to be required on a larger percentage of farmland (7 percent rather than 5). One requirement to maintain green cover on 70 percent of arable land, open air horticulture and permanent crops was entirely dropped. Interestingly, the program that was ultimately adopted gives farmers a great deal of choice as to how to meet requirements, a feature that the Commission explicitly warned would detract from the program’s environmental effectiveness as well as its coherence with the cross-compliance program (especially in relation to GAEC requirements, which are sometimes overlapping). This scenario is that which materialized. Changes to the initial proposal were driven by voices interested in minimizing the burden on farmers rather than by ones trying to safeguard environmental progress. A related shortcoming is that the budget allocation for greening was based on a political decision and not on the costs of meeting the program’s environmental objectives. This likely did not help those defending the program’s stringency.

The auditors’ report recommends that all requirements to meet a set of agri-environmental farming norms (including GAECs and greening requirements) be rolled into the cross-compliance program. It also

⁷¹ The ecological focus area (EFA) requirement drove most of the change (2.4 percent of farmland), followed by the crop diversification requirements (1.8 percent), and the permanent grassland measure (1.5 percent).

recommends that greening payments be based on meeting measurable environmental performance targets, that those targets be ambitious enough to support the EU's broader environmental and climate protection goals, and that the size of payments be linked to the true costs of meeting those performance targets (factoring in expenses and foregone income).

Greening in its political and economic context

On a conceptual level, the most recent rounds of reforms rest on the principle that a core function of the CAP is to enable the “joint provision of public and private goods [by active farmers⁷²] by creating conditions under which they are rewarded for the services they deliver to the wider public, such as farmed landscapes, farmland biodiversity, and the preservation of climate stability—even though, in the absence of collective action, these services have no market value (EC 2013a). “Greening” payments were put in place in recognition that market prices do not reflect the effort involved in providing public goods related to climate stability and other aspects of the environment (EC 2016a).

From the perspective of implementing the above vision and environmental objectives, however, the recent CAP reforms—notwithstanding their embrace of environmental principles—do not constitute an optimal approach to achieving these. Not only did they lack ambition, but they also failed to follow the best practice approach of using at least one instrument per policy objective (see more on the effectiveness of greening below).

Indeed, the pursuit of environmental objectives predominantly remained subservient to the objective of supporting farmers' incomes. Most CAP funding with environmental strings attached is for direct payments subject to cross-compliance and greening requirements, and direct payments are first and foremost an income support program. Only under pillar 2, the smaller pillar, do environmental objectives have dedicated instruments and funding. This hierarchy of priorities (income support > environment) is underscored by the fact that the environmental conditions attached to direct payments have only required a small minority of farmers to change their farming practices for the sake of environmental protection. Cross-compliance, after all, only requires farmers to comply with existing laws, and “greening” practices were already widely adopted, such that changes in farming practices were required on less than 5 percent of the EU's farmland when the program came into effect (multiple sources in ECA 2017).⁷³ Environmental conditionality has been better, it seems, at limiting additional harm to the environment than at encouraging additional environmental action.

Schematically, with CAP reform, the “center of gravity” of environmental subsidies shifted from pillar 2 (rural development programs) to pillar 1 (income support), and not the other way around as it could have. Rather than use the impetus to reform pillar 1 (which at the time distorted production decisions) to refocus spending on the environment, environmental protection (in the form of cross-compliance and later greening) was instead used to maintain pillar 1 in place. This turn of events most likely reflects the prevailing political economy, including such elements as organized farm interests in favor of maintaining income support in place, heightened concern about food security in the aftermath of the food price spike of 2007–08, member states' reluctance to see pillar 2 grow in size due to that pillar's national co-financing

⁷² To participate in Basic Payment Scheme and related schemes a person must be an “active farmer” as defined in Regulation (EU) No 1307/2013 and related regulations.

⁷³ This assessment, confirmed by several studies, points to the limited significance of the fact that upward of 70 percent of EU farmland was subject to at least one greening requirement—and hence of the program's key result indicator.

requirements, and a lack of advocacy for setting the bar higher (in environmental terms) under pillar 1 (Matthews 2013).

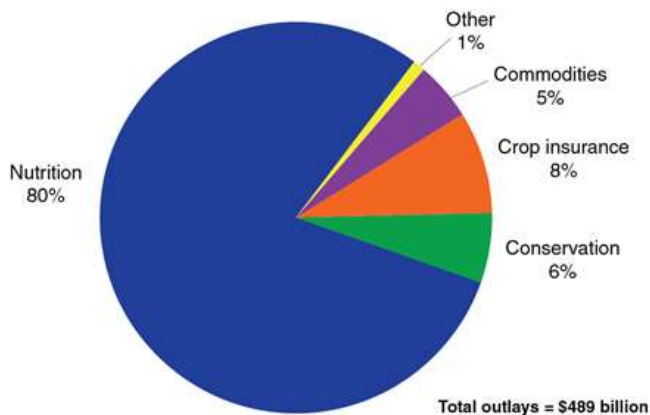
A transfer of pillar 1 income support funds to pillar 2 could have instead supported the adoption on a much wider scale of “additional” environmental measures going beyond what is required by law and what was already adopted in practice. A reform along those lines, moreover, would have likely been more efficient and certainly more consistent with the best practice of using at least one instrument per objective, and of using each instrument to achieve no more than one policy objective at a time. Meanwhile, even under the current reform structure, privileging pillar 1, the bar could have been set much higher in terms of what is required of farmers, under cross-compliance and greening, to access income support (direct payments).

Annex IV: United States: major agri-environmental subsidy programs

In the United States, nearly all farm support is tied to “conservation compliance,” the equivalent of the EU’s environmental cross-compliance, although the requirements are more targeted in the United States than they are in the EU. In the United States, requirements apply to cropland that is highly vulnerable to erosion as well as to wetlands. In order to qualify for income support under the commodity programs, for crop insurance premium subsidies, or even for voluntary conservation payments, farmers must adopt specific practices designed to reduce soil erosion. In addition, farms located in wetland areas are barred from draining the land. These conservation requirements were initially put in place in 1985, suspended in 1996, and reinstated in the 2014 Farm Bill (OECD 2017a, Chite 2014).

In addition, multiple federal subsidy programs directly support environmental objectives on agricultural lands, although several were merged and consolidated in the 2014 Farm Bill (P.L. 113-79). Overall, more is spent on conservation than on direct payments to commodity farmers (an estimated USD 6.8 billion per year on conservation programs) (Figure 12) (USDA ERS 2018).⁷⁴

Figure 12: Projected outlays under the 2014 Farm Bill, 2014–18



Source: USDA ERS 2018 using data from Congressional Budget Office, Cost Estimates for the Agricultural Act of 2014, January 2014.

These conservation programs generally offer farmers financial and technical assistance for voluntarily (1) retiring sensitive land from agricultural production, (2) adopting environmentally-friendly production practices on working agricultural lands,⁷⁵ or (3) establishing easements to protect the agricultural nature of the land (that is, preventing its conversion to residential or commercial uses). Other conservation programs are also in place to facilitate partnerships to address regional environmental issues. The major conservation subsidy programs in the 2014 Farm Bill are described below.

Since 1985 (or the 1950s if similar predecessor programs are factored in), the **Conservation Reserve Program (CRP)** has paid farmers to remove environmentally sensitive land, including wetlands, from

⁷⁴ The Congressional Budget Office estimated that spending on Title II Conservation programs would total USD 57.6 billion over fiscal years 2014–23 (Zulauf 2014).

⁷⁵ In terms of effectiveness, one study by the United States Department of Agriculture Economic Research Service, using data from 2009 to 2012, found that more than 90 percent of producers who received conservation payments for “structural off-field” practices (such as field borders and filter strips) would not have adopted the practices without a payment (Claassen, Duquette, and Smith 2018).

production and maintain it under beneficial vegetative cover (such as native grasses, wildlife plantings, trees, filterstrips, riparian buffers). Under the CRP, farmers receive rental payments under 10–15 year contracts with the government. They may also receive additional funds to cover part of the cost of establishing vegetative cover. Unlike other environmental subsidy programs (EQIP and CSP), the CRP is not competitive; farmers need only apply and meet program requirements. The long-term goal of the program is to re-establish valuable land cover to help improve water quality, prevent soil erosion, and reduce loss of wildlife habitat. The CRP is the largest of the United States' conservation programs, with a budget on the order of USD 1.8 billion per year (FY 2016), a level that amounted to just over one-fifth of total direct payments to farmers in FY2016 (USDA FSA n.d.).

One of the country's largest conservation programs, the **Environmental Quality Incentives Program (EQIP)** provides technical and financial assistance to farmers for adopting natural resource conservation and environmentally beneficial practices on working farms, ranches, and forests. The program, which dates from 1996, selects farmers to receive assistance, prioritizing applicants on vulnerable lands and in degraded watersheds, and with innovative proposals. The program supports some 200 practices, including the establishment or maintenance of cover crops, pollinator or other wildlife habitat, shelterbelts, fencing, micro-irrigation, and prescribed grazing. The program generally aims to improve soil, water, and air quality, reduce erosion, and improve wildlife habitat (5 percent of funding is set aside for wildlife habitat activities, and 60 percent for activities on livestock farms).

The **Conservation Stewardship Program (CSP)** has, since 2002, supported new and ongoing conservation efforts for producers who maintain or improve their conservation system on working agricultural and forest lands. EQIP and CSP select farmers for funding on the basis of a ranking system. It is possible that the 2018 Farm bill will merge the EQIP and CSP programs.

Since 2004, the **Conservation Innovation Grants (CIG)** program has provided grants on a competitive basis to one-to-three-year conservation projects addressing emerging and high priority natural resource concerns at the watershed, regional, or multi-state level.

The **Agricultural Conservation Easement Program (ACEP)** provides financial and technical assistance for land owners to prevent the conversion of agricultural land and wetlands to non-agricultural uses. Although it was established as recently as 2014, ACEP subsumed programs that had been in place for 20 or more years. It has two main components. The **Agricultural Land Easements** component helps American Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. The government contributes up to 50 percent of the fair market value of the agricultural land easement, although that share can go up to 75 percent for grasslands of special significance. The **Wetlands Reserve Easements** component of the program (formerly the Wetlands Reserve Program) helps to restore, protect, and enhance wetlands on private land. The purpose of these easements is to provide habitat for wildlife and protect biodiversity, improve water quality by filtering sediments and chemicals, reduce flooding, recharge groundwater, and provide opportunities for educational, scientific and limited recreational activities. Easements can be created in perpetuity, for 30 years, or other terms consistent with state laws. For permanent easements, the government pays 100 percent of the value of the easement, and 75–100 percent of the restoration costs. For 30 year easements, the government pays for 50–75 percent of the easement cost, and for the same share of the restoration costs.

The **Regional Conservation Partnership Program (RCPP)** supports efforts to coordinate conservation program assistance at the regional or watershed scale. This program merged the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative, the Great Lakes Basin Program, and the Agricultural Water Enhancement Program.

Separately, the **USDA Organic** program includes organic certification cost-share assistance for farmers.

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