EU Policies and Global Food Security

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Abstract

This paper reviews evidence on the impact of EU policies on global food security, focusing on four EU policy areas: agricultural policy, bioenergy policy, trade policy, and development (food aid) policy. Old concerns related to the detrimental impact of EU farm subsidies, food aid and tariffs on poor countries' food security. New concerns relate to impacts of EU food standards and bioenergy policies. The EU policies which created the largest distortions on global markets (in the area of trade, agriculture, food aid, and bioenergy) have been substantially reformed over the past decades. Recent global food price fluctuations have also re-emphasized that the impact of EU policies on the poor's food security differ depending on whether these are consumers or producers, or whether countries are exporters or importers. Overall, our review explains that in many areas the impact of EU policies on global food security is less obvious and more complex than often argued.

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1. Introduction

Many aspects of EU policies affect global agricultural markets and food security. They include the Common Agricultural Policy (CAP), the EU bioenergy policy, trade policy, development aid policy, fisheries policy and, through different mechanisms, the EU's macroeconomic and immigration policies. Development organizations have long criticized the lack of coherence of EU policies and the conflicting consequences on developing countries, including on food security. For example, the EU used to stabilize its domestic agricultural markets thanks to variable high tariffs and export refunds (i.e. subsidies). This led to dumping agricultural surplus production on world markets for decades. This led to lower market prices and also contributed to destabilize world markets. This undermined local production in developing countries. For that reason, the CAP was accused of undermining EU development policy that was precisely trying to help building local food supply. The EU's renewable energy policy (biofuels), and the EU trade policy (tariffs, restrictive import standards) were also accused of incoherence with EU efforts to fight nutrition and food insecurity. A key question today is whether these criticisms are still valid?

Much has changed over the past 20 years. The coherence of policies with its development cooperation objectives has been taken more seriously within the EU.[1] The food aid policy, for example, has experienced considerable changes over the last decades. The EU has granted the poorest countries generous pro-development trade preferences (such as the Everything But Arms initiative), whose purpose was to help developing countries' producers. The CAP itself has changed dramatically since the early 1990s. In addition, the "food crisis" of the late 2000s has reminded everybody that the impact of food prices on food security is complex: the consequences are often opposite for food consumers and food producers in poor countries. At the same time, new areas of critique are that EU food standards are creating non-tariff barriers to trade and excluding poor farmers from access to markets, worsening their food security; that EU imports from developing countries have perverse effects on local

[1] Reforms of the EU food aid programs followed demands for changes by development organisations. These reforms illustrate the Policy Coherence Debate that has taken place since the early 2000s (Matthews, 2008). For example, somme of the Commission reports on Policy Coherence consider the impact of EU policies on food security (EC, 2015). So do the Sustainable Impact Assessments that are carried out before trade agreements and large scale policy reforms.

livelihoods and the environment: and that EU bioenergy policies are hurting the poor's food security if one takes into account global price effects.

In this paper we review evidence on the impact of EU policies on global food security. Needless to say we need to limit our ambition to what is possible within the framework of this relatively short review paper. First, we focus on a subset of EU policy areas, i.e. the CAP, bioenergy policy, trade policy (including standards that emerge from EU food safety policy), and development (food aid) policy.[2] Second, we focus on "global food security", i.e. on the impact of these policies on food security in developing countries. Third, while we recognize that there are multiple channels through which EU policies may influence various aspects of food security[3], we focus on how it affects the poor through prices and incomes and to a lesser extent through access to technology and inputs – and thus how it affects their food security indirectly. While this focus limits the analysis, it nevertheless covers a broad set of issues and effects. A recurring theme throughout our paper is that the impact of EU policies on global food security is less obvious and more complex than often argued. The paper is organized as follows. Since one of the main channels that EU policies affect global food security is through (agricultural and food) markets and prices, we start with a discussion on how changes in markets, trade and prices affect global food security (Section 2). In the following sections we discuss how the EU policy areas we focus on affect markets and prices and thus food security (Sections 3-7). Section 8 concludes.

2. Food Prices, Volatility and Food Security

[2] One policy area which our review does not (explicitly) cover is the EU fisheries policy. Acquaculture fisheries, and its products, are an important source of income and food for many (poor) people. The past two decades have witnessed a rapid increase in acquaculture production (both through fishing and through acqua-farming), with dramatic shifts in global production, consumption shifts and trade (Reardon, 2016). These developments have been affected by EU regulations on (il)legal fishing and EU food standards. We capture some of these issues in Section 5 but to do full justice this issue probably deserves a review in itself.

[3] "Food (and nutrition) security" (FNS) and its different components (availability, access, utilization of food, and stability of these components), have been defined rather precisely after decades of controversies, in particular under the auspices of the Food and Agriculture Organisation and the International Food Policy Research Institute (Pangaribowo, et al, 2013). For an elaborate discussion of the potential mechanisms through which various EU policies may affect FNS and its different components, see Guariso et al (2015).

When discussing the impact of EU policies on food security, it is crucial to have a clear understanding on how agricultural and food prices and trade affect global food security.

Price Levels

Only a few years ago the emphasis in the public debate was on how *low* food prices were hurting the poor's food security. Typically, reports from NGOs and policy institutes would argue that the downward trend in agricultural commodity prices, reinforced by subsidized exports from rich countries, threatened the food security of hundreds of millions of poor people in developing countries which depended on agricultural sales for their livelihood. After the dramatic increase of food prices in 2006-2008 many reports of the same organizations emphasized the problems caused by *high* food prices for global food security, arguing that rising food prices threatened the food security of poor people around the world and that these could have long-term, detrimental effects on peoples' health and livelihoods. This change in emphasis was widespread (see Swinnen, (2011) for detailed analyses and references).

Basic economic household models imply that the impact of price changes on poor people and their food security are conditional on several factors. First, many poor households in developing countries are both producers and consumers of food and are thus affected in different ways by price changes.[4] Second, local prices may differ from world market prices (and changes), as the former are affected by various policies (trade policy, taxes, etc.), by infrastructure and institutions, and by the industrial organization of the food chain. Third, short-run effects may differ from long-run effects, as pass-through may take some time.

While these basic economic arguments were well known, they were often ignored in the food security debate. For example, there was hardly any mentioning of the benefits of low food prices for urban consumers and net consuming rural households during the pre-2006 low price era, and there has been little emphasis on the benefits for producers in poor countries

[4] By 2010 around 12.5% of the people in the world were undernourished (FAO, 2012) and less than 21% of the people were living below the poverty line (World Bank, 2013). The vast majority (more than 70%) of poor and food insecure people are depending on agriculture for their incomes: around 50% were small farmers and 20% households whose main income is agricultural wages (UNDP, 2005).

from high food prices during the public debate following the food price spikes (Swinnen and Squicciarini, 2012).

Recent empirical studies, however, have shed light on these mixed effects of prices on global food security and poverty (Ivanic and Martin, 2015). Based on cross-country evidence on self-assessed food security indicators, both Headey (2013) (across the globe) and Verpoorten *et al.* (2013) (for Africa) find that there is much heterogeneity at the national and regional levels – and among households and that the heterogeneity of food security effects are consistent with economic predictions, as they were (positively) correlated with economic growth and net food production (exports), both at the household and country level.[5] A rapidly growing number of empirical micro-studies confirm that farmers and rural households have benefited from high food prices and that poverty and food insecurity increased among net consuming households.[6] Several recent studies also point out that wage effects are important for the very poorest, and that also net consuming rural households may benefit from higher agricultural prices if one accounts for price induced wage increases.[7] Finally, some recent simulation studies have integrated the different effects (including distinguishing between short-run and medium-run effects of price changes) and concludes that except for urban consumers and very short run effects, higher agricultural prices reduce poverty and food security on aggregate (Heady, forthcoming; Headey and Martin, 2016). That is, overall, recent studies tend to vindicate the traditional view that low agricultural prices hurt food security.

However, while the heterogeneous effects among households and countries will remain important, the aggregate effects may be different in the future as structural

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[5] Verpoorten *et al.* (2014) find that across 50,000 households in the African survey, self-reported food security improved on average in rural households, while it worsened in urban households, during the 2007-2010 period of high prices.

[6] Arndt *et al.* (2012) for Mozambique; Ferreira *et al.* (2013) for Brazil; Friedman *et al.* (2011) for Pakistan; and Martin-Prevel, *et al.* (2012) for Ethiopia. Isik-Dikmelik (2010) finds that rice price increases (following liberalization) in Vietnam led to broad based and pro-poor growth since many of the poor are farmers and, on average, consumers typically have higher incomes. Yamauchi and Dewina (2012) find that in rural Indonesia food producers experienced significantly income growth, while non-producers' incomes fell, thereby narrowing inequality (the income gap). The same follows from studies simulating the impact of biofuel policies on poverty and food security in China (e.g. Huang *et al.* (2012)

[7] Jacoby (2016) finds this for Indian rural households. Lasco et al. (2008) also find that wages adjust strongly to rice price changes in the Philippines. Krivonos and Olarreaga (2010) also conclude that labor market effects are important when measuring the impact of food price increases on poverty and food security in Brazil.

transformation of developing economies and rapid urbanization will increase the number of net food buyers and their share in the population. That said, in making predictions it is important to continue to take into account different poverty and income dynamics among rural and urban populations in the future: even in an urbanized world, poverty and food security may remain most problematic in rural areas.

Price Volatility

An issue which was strongly emphasized in the recent public debate is the impact of increased price volatility on food security. A recurring argument is that price volatility is undesirable as it causes inefficiencies and reduces growth in the absence of insurance and credit markets (Dawe and Timmer, 2012). This is because unexpected price changes make it difficult for consumers and producers to make optimal decisions and it reduces their confidence in the market and in returns on investment. Therefore, following 2006-2008, many policy reports have emphasized the importance of reducing price volatility (e.g. FAO, 2011; Prakash, 2011; World Bank, 2012). With market imperfections in insurance and other markets, government interventions to reduce price volatility can be efficiency enhancing.

Yet, studies which have explicitly modeled the effects of price volatility on consumer and producer welfare yield more nuanced conclusions (Gouel, 2014; Pieters and Swinnen, 2016), similar in spirit to the conclusions on the effect of the price level.[8] For households that both consume and produce food, the impact of price volatility on their welfare depends on their marketable surplus, risk aversion and income and price elasticities (Barrett, 1996; Myers, 2006). If the household is a net-seller of agricultural products and is risk averse, the household is more likely to suffer from price volatility. Bellemare *et al.* (2013), who use data from Ethiopia, conclude that price volatility produces net welfare losses, but the losses are

[8] The arguments are based on Newbery and Stiglitz (1981) and Turnovsky *et al.* (1980) who show that price volatility fluctuations around the mean may actually benefit consumers if the price elasticity of demand is high, if their budget spend on food is rather small and/or if they are risk loving – a generalization of a basic argument made by Waugh (1944). Poor consumers in developing countries who spend a large amount of their budget on food and who are risk averse will be likely to benefit from stable prices. Similarly, producers may use less inputs and have lower profits if prices are volatile and uncertain (Sandmo, 1971) – but they may also have positive effects from price volatility (Oi, 1961).

increasing in household income, meaning that it is not the poorest but those who produce a marketable surplus who suffer more. In summary, these findings suggest that price volatility reduces welfare and food security of some groups but the effects are not meaningful for all in society, and not necessarily for the poorest. For the poorest, Gouel (2014) suggests that food price volatility is costly not because of the volatility *per-se*, but because it leads to potentially high prices that can have long-term consequences because the associated decreased health or school expenditures can have irreversible consequences that cannot be compensated by the later benefits of low food prices.

3. EU agricultural policy

For decades, the EU used a system of variable levies[9] and export refunds to manage its domestic market. This was largely done at the expense of third countries, which experienced lower prices and more volatility when the EU used such instruments to clear its domestic market. EU subsidies to production and exports helped EU farmers but made competition difficult for local producers in developing countries. The EU policy led to cheap imports of flour, beef or dairy products in many countries, including in West Africa, the Middle East, the Caribbean and even India (dairy) (Miner and Morgan, 2004). These cheap imports benefited local consumers but hurt local producers (Panagariya, 2005). The EU's impact on the world market increased in the 1970s and 1980s as the EU itself expanded, and as subsidies and tariffs turned the region from an importer of agricultural and food products into a net exporter of food.

The CAP has experienced major reforms since 1992. These reforms were driven by a combination of factors (Swinnen, 2008, 2015). In particular, the budget cost of export refunds became considerable for the EU budget in the 1980s and forced a change in the price support system.[10] Multilateral pressure by third countries also played a role. Outside pressure came

[9] Variable levies were replaced by fixed bound tariffs in 1995, as part of the WTO agreement on agriculture. Some tariffs remained *de facto* flexible due to an particular price system for fruits and vegetable, and were temporarly adjusted downward in several occasions for cereals (in time of high prices such as in 1996, 2007, etc.).

[10] Export refunds made it possible to clear EU markets when production was boosted and consumption deterred by high prices which were set administratively. EU import tariffs and export subsidies varied to capture the difference between (fixed) domestic prices and (fluctuating) world market prices. This system of variable tariffs

from exporting nations such as the US and Australia, and from developing countries and international organizations that accused the EU of causing poverty and hunger in poor rural households. In response to these internal and external pressures, the EU introduced a series of reforms, spanning three decades, to reduce the impact of its CAP on international markets (Moehler 2008).

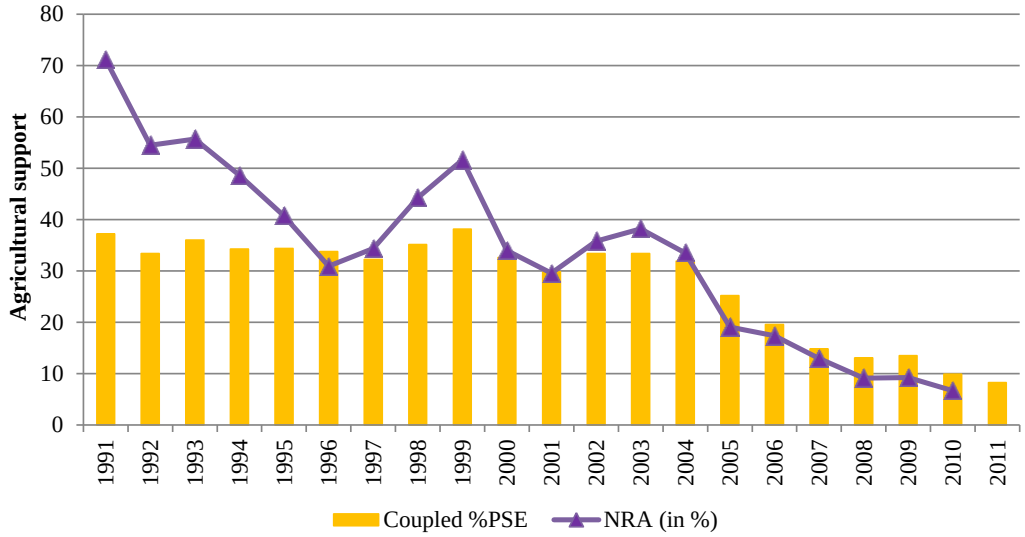
These reforms led the EU to get rid of the measures that led to subsidize the export of agricultural surplus into developing countries. Such export refunds have been fully eliminated since June 2013, and the EU has committed not to provide export subsidies after 2020.[11]. As Figure 1 illustrates, the amount of distortionary subsidies that distort markets, captured by the World Bank's NRA and the OECD's PSE indicators, has declined very strongly in the 1990s and 2000s. Today, most of the support to EU farmers goes through direct payments which provide only limited incentive to produce and export more.[12]

and subsidies ensured stable prices inside the EU, but intensified fluctuations outside the EU since export subsidies would be even higher when world market prices were lower.

[11] The EU no longer subsidizes exports but the Nairobi Decision allows the EU to continue export subsidies for processed products, dairy products and pigmeat until 2020 if it wishes to (footnote 4 of the WTO Declaration on Export Competition).

[12] From the mid 2000s onwards the vast majority of EU farm support (€35 billion euros per year) is provided as Single Farm Payments which are largely decoupled from production. After the reforms, prices in the EU are close to those on world markets and the impact of the current CAP on global prices is much smaller than in the past. Several studies show the large impact of EU policies on global food markets during the 1980s (e.g. Van Meijl and van Tongeren 2002). Recent studies show that EU policies no longer had a significant impact on the price volatility of major food commodities (Anderson and Nelgen 2013; Anderson et al. 2014). Unlike other countries, such as Russia and China, the EU has also not introduced export constraints for food during the recent price spikes.

Figure 1: Agricultural support in the EU (%PSE and %NRA)



Source: Anderson and Nelgen (2013), OECD, World Bank

There are nevertheless still some impacts of EU agricultural policies on developing countries. First, the considerable amount of subsidies provided to EU farms (some €56 billion per year) still have some effects on world market due to risk aversion and wealth effects (Gohin and Zhen, 2016). Direct payments also slow farm consolidation, and in their absence there would probably be less (marginal) land and less labour used in agricultural production. Recent studies suggest that the impact on agricultural productivity is positive (while the old CAP subsidies had a negative impact on productivity) (Kazukauskas et al 2014; Rizov et al 2013). In any case, the impact of the CAP reforms and in particular the decision to decouple most subsidies from production decisions has significantly reduced the distortionary impact on output and global markets compared to past EU agricultural policies. And that their positive effects on production are offset by the cross-compliance and greening requirements for eligibility for these payments, as well as Pillar 2 measures for extensification and afforestation, (see a discussion in Mathews et al, 2016). Finally, one can argue that the trade (and thus global food security) impacts are limited compared to those caused by recent policy developments in the U.S and emerging countries. Indeed, figures compiled by OECD (2016) and Anderson (2016) show that there has been an significant increase in farm support which is

coupled to production in the U.S. and in emerging countries such as China, Indonesia or Russia (when adjusted for currency depreciation) over the recent years.

Second, when world prices were high in the mid 1990s and in the late 2000s, the EU lowered temporarily tariffs on grains (e.g. corn), so as to provide some relief to EU livestock producers. Conversely, tariffs were increased when world market prices went down. These policy changes may have contributed to amplify the volatility of world prices to a limited extent. However the EU policy's impact on global price fluctuations was limited compared to the export restrictions and export taxes that many emerging countries have implemented during these price peaks (Anderson et al 2014).

In summary, while the EU policies still have some effect on world prices and thus potentially on food security in developing countries, today's CAP has a much smaller impact on world markets than in the past (Bureau & Jean 2013). The recent "recoupling" of some EU subsidies that took place in 2015 is limited to specific productions that do not seriously compete with poorest countries productions. Similarly, Matthews (2014, p14) concludes that the recent CAP reforms will have "*mixed and contradictory impacts*" on the EU's supply capacity and thus on global food security, and that the effects will be small: "*the impacts of all these changes … will be very minor, particularly in the context of the swings in world market prices experienced since 2008*"

4. EU Bioenergy Policy

The EU biofuel policy was originally presented as a way to reduce greenhouse gases emissions. However, supporting EU farm incomes by providing a new outlet for feedstocks was also a major objective when it was introduced in the early 2000s. This policy affects global food security as the EU's biofuel mandate directly affects global prices, as well as environmental and social effects which could indirectly impact food security.

The 2009 Renewable Energy Directive sets a target[13] that *de facto* constitutes a blending mandate, i.e. a compulsory incorporation of biofuel in transport fuel. Such a mandate

[13] The compulsory target set under the RED is 10% of road transportation fuel must be renewable. So far this mostly involves using biofuels given that these are the only liquid fuels that it the existing car fleet. The use of biogas remains marginal.

rigidifies the overall (food plus fuel) demand for feedstocks. As a consequence, considerable quantities of feedstocks have been diverted towards the energy market. In the EU, it is mostly rapeseed, and to a lesser extent sugar beets, wheat and corn. Biodiesel accounts for 81% of EU consumption of biofuel for transportation; the rest is mostly ethanol. While rapeseed oil remains the dominant biodiesel feedstock in the EU, its share has gone down over the last years, with an increasing use of palm oil and used cooking oil and animal fats. Imported palm oil is increasingly used for EU biodiesel production.[14] The demand for palm oil is reinforced by new technologies which make it easier to use palm oil (hydro-treated vegetable oil); and by the EU policy to favor the use of waste (tallow, used cooking oil, which benefit from a "double counting" in terms of compulsory blending requirement) in biofuels. Indeed, these products traditionally went to the cosmetic and detergent industry which now uses more palm oil, as the food industry does.

EU support for biofuel thus result in higher world prices.[15] Biofuel outlets have contributed to lower stocks of feedstocks worldwide and Wright (2012) has clearly shown that lower stocks make supply more inelastic. With both supply and demand more inelastic, the EU biofuel policy thus contributes to the amplification of price swings.[16] There are also indirect impacts on global prices through Direct and Indirect Land Use Change (dLUC and iLUC) effects of the EU biofuel program (Valin et al, 2016). By diverting feedstuff (e.g. mostly rapeseed in the EU) into the energy market, biofuel policies induce price changes that

[14] Palm oil has become the second most important feedstock. The development of palm oil based biodiesel has been benefited from the development of hydrotreated biodiesel, at the expense of esters based on rapeseed oil (Fatty Acid Methyl Esters). In 2016, USDA estimates that 6.1 million tons (MnT) of rapeseed oil, 2.4 MnT of palm oil, (up from 0.9MnT in 2011), 2.4MnT of used cooking oil, 1.1 MnT of animal fat and 0.6 MnT of soybean oil were used in EU biodiesel.

[15] With the exception of some markets for co-products, such as rapeseed cakes used for animal feed. See De Gorter et al (2015) and Valin et al (2016) for a review of the economic effects of the EU biofuel policy.

[16] The EU incentives for using biofuels contribute to higher prices *ceteris paribus*. Indeed, the biofuel policy support domestic prices by taking feedstock out of the food and feed markets. The old CAP took away some quantities from the domestic market and transferred them to the world market. While the biofuel policy transfers them to the energy market, whose demand elasticity is very large, due to the size of the fuel market. See Bureau et al (2010) and Valin et al (2016) for estimates of the price effects.

cascade across products and markets through supply and demand effects and cross elasticities.[17]

The EU biofuel policy thus affects food security in the same direction as the reform of the CAP (decoupling of support and end of export subsidies), i.e. by increasing world prices for agricultural products. Again, the impact will depend on the net producer/consumer status of the households (and the net export status of the countries) for the products whose prices are affected by the EU biofuel program.[18]

While it was originally intended to provide an outlet to domestic producer of cereals and oilseeds[19], the EU biofuel policy now contributes to drive up the demand for palm oil. Consequences for food security are controversial. The increased production of palm oil for export to the EU has stimulated the expansion of palm plantations. In South East Asia, this has led to (or at least gone together with) deforestation, massive fires of drained peatland –some of them affecting health and economic activity in neighboring regions–, degradation of water quality, changes in local climate and in the nitrogen cycle. [20] Non governmental organizations raise the issue of the long term consequences on food security caused by environmental degradation and competition with traditional farming systems (e.g., GRAIN, 2014). They point out negative consequences on the environment on which poor people rely for their food security because of the degradation of natural capital that was a source of food for small farmers (e.g. Papua New Guinea), and also point out negative consequences on

[17] For example, the increased demand of corn for ethanol causes by the U.S. biofuel mandate lead to expand US supply, at the expense of soybean. Because the EU and Chinese demand for soy, the price has gone up, resulting in a considerable increase in production in South America. More globally, changes in world prices can lead to transforming pasture, savannah or even rainforest into, say, soybean, cane rapeseed or palm oil production.

[18] Huang et al (2012) suggest that the US ethanol program is enhancing food security in China as most poor Chinese farming families who produce grain are net sellers, and the increased demand for grain of the US ethanol program thus increases their incomes. The situation may be different for net buying households.

[19] See Bureau et al (2010) who claim that in spite of the stated objective of reducing greenhouse gases emissions, the main driver for the EU biofuel policy was to provide outlets to the EU agricultural sector in the early 2000s.

[20] In Southeast Asia, 45% of sampled oil palm plantations came from areas that were forests in 1989. For South America, the percentage was 31%.(Vijai *et al.*, 2016; Gibbs et al, 2010). Carlson et al (2012) provide information on the conversion of community land into large scale plantations in Indonesia. De Jong et al (2014) provide evidence of the disruption of oil palm plantations on water supply and water quality in Indonesia; Hamilton et al (2016) of palm related deforestation on the nitrogen cycle.

traditional farm system in African countries where there was a tradition of common use by local communities of land that was privatized for the development of palm plantations.[21]

However, other authors find that the expansion of palm oil production, on large scale plantations as well as on small farms, result in employment and extra income, with positive consequences on the food security. In Indonesia, studies find that villages with oil palm as their main source of income show significantly lower rates of malnutrition and higher food consumption expenditures (Budidarsono et al. 2012; Euler et al. 2017). Edwards (2016) even estimates that 1.3 million Indonesians were lifted out of poverty between 2000-2010 due to oil palm expansion.

In response to criticisms on the impact on food prices (in particular during the years of high food prices) and its environmental and sustainability impacts (in particular regarding palm oil expansion), the EU has introduced a series of policy adjustments by increasing the amount of GHG emissions reduction compared to fossil fuels required for eligibility to meet the mandate.[22] It also requires an environmental certification, in particular for palm oil but which had only had a limited impact on deforestation and peatland fires according to Cattau et al (2016)..

Overall, there is a need to get a more comprehensive assessment of the impact on food security of the EU biofuel policy, taking into account on the one hand the income generated by the expansion of palm oil and the positive employment effects; and on the other hand the deterioration of ecosystems and natural capital.

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[21] See Greenpeace (2012) among numerous NGO studies. Note, however that Nelson et al (2014) find that the primary driver of deforestation in Papua New Guinea is logging and that palm plantations proposals (that never materialize) are often a vector for "*large-scale land grab under the guise of oil palm development*".

[22] The EU RED now requires that biofuels reduce GHG emissions 50% from fossil fuels (prior to 2017 only a 35% GHG reductions were required). If there are still strong incentives to use palm oil under the category of "used cooking oil", standard palm oil-based biodiesel only reduces GHG emissions by 36% (Flach et al. 2016). Further, the EU RED has stipulations designed to reduce iLUC by limiting the use of food crops in biofuels (which includes both palm and rapeseed-based fuels). Biofuels derived from food crops were capped at 7% of transportation fuel use in 2015. The latest proposal to replace RED when it expires in 2020 calls for even stricter limits (3.8%) on "first generation" biofuels, i.e. those that are based on raw materials that are also used for food.

5. EU Development (Food Aid) Policy

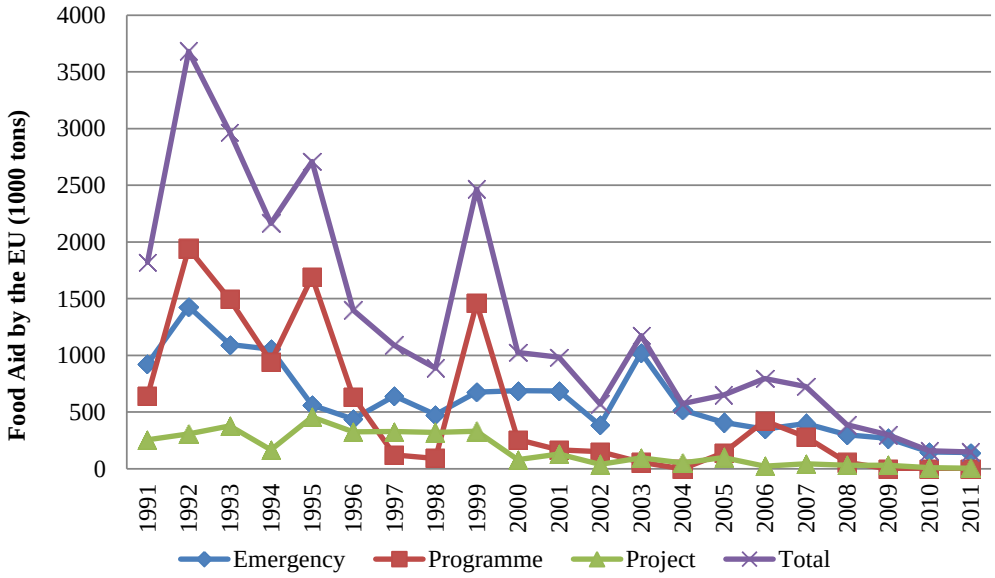
Assessing the impact of the development policies on food security would require investigating the success or failures of a large set of heterogeneous projects. There has been a significant increase in the share of EU development aid targeted to food and nutrition security (FNS) since the start of the food crisis -- much in line with the global increase in FNS in development aid (Guariso et al, 2014). However, Cockx and Francken (2016) find that evidence on the direct impact of EU development aid programs on global food security is inconclusive, and that while one would expect several of these programs to have positive effects, hard evidence is "surprisingly weak".

One highly publicized, and highly criticized, aid policy was the provision of in kind aid. Because food aid was sometime used to dispose EU agricultural surpluses, it was not always distributed when relevant and could squeeze local production out of local markets. Since the early 1990s, the EU has adopted a code of "best practice" in the provision of humanitarian food assistance (EC, 2008, 2013). That is, food aid is given in case of well identified need of humanitarian assistance, and as long as local markets can supply it, the priority is given to purchase local food. Evaluations show that these good practices have reduced the former perverse effects of food aid, even though some limitations of the current policy in terms of nutritional aspects, and sometimes the nutritional issues associated to the distribution of local food were criticized (Haver *et al.*, 2013).

In addition, the use of in-kind food aid by the EU has diminished significantly over the past 20 years. Figure 2 illustrates how in-kind food aid has declined from around 3 million tons per year in the early 1990s to much lower amounts in recent years.[23] Part of this decline is due to the fact that agricultural surpluses (and therefore EU stocks) have diminished with the reform of the CAP.

[23] Note that the EU has recently allocated some of the dairy aid package to provide surplus dairy products to Syrian refugees.

Figure 2: International food aid by the EU (thousand tons of wheat)



Source: World Food Programme FAIS database.

6. EU Trade Policy

Two types of criticisms have been made to the EU trade policy. The first one is that demand for particular types of imports have resulted in expansion of export agriculture to the expense of self sufficiency, hence food security. One dimension of the problem stressed by several organizations is that large scale investments for export agriculture are often made at the expense of small farmers and communities' access to land, in particular in countries with weak institutions. The second criticism, on the contrary, is that the EU is described as "fortress Europe" that prevents developing countries to export productions in which they had a comparative advantage, i.e. agricultural products.

There has been a long lasting debate on whether the development of export oriented agriculture was good for food security in developing countries. Several non-governmental organizations – and a few academics– have claimed that such development was detrimental to the subsistence agriculture that allowed poorest people to feed themselves. Today, the debate is largely resolved: there is large evidence that cash oriented production, including for

exports, allows capital accumulation, investment and productivity gains (with positive spillovers on food production), while subsistence agriculture is a trap from which it is difficult to exit without further market integration (World Bank, 2007). Accusations that export crops such as cotton, coffee or fresh vegetables "steal" land that is no longer available for subsistence crops have been largely proven unfounded (von Braun and Kennedy, 1994).[24] Export crops have contributed to bringing investment capacity for local producers and to exit the vicious circle of subsistence agriculture. Moreover several recent studies show how revenues and access to inputs and technology through export value chains are stimulating food production at the household level by reducing capital and technology constraints and household-level spillovers (Minten et al 2009; Riera and Swinnen 2015).

A more recent concern is whether the development of plantations for export crops results in depriving small farmers of land or other resources such as water in countries with weak institutions or corruption (Nolte et al, 2016; Rullia et al, 2012). Concerns about "resource grabbing" by foreign investors have been widely publicized in the media and are often quoted by NGOs such as People Forest, OXFAM and Friends of the Earth, and international organizations like FAO and IFPRI. While there is ad hoc empirical evidence that Asian and Middle East companies and governments are attempting to secure agricultural supply by the acquisition of foreign land, often in Sub-Saharan Africa, there is no consensus on the size of the phenomenon (see Deiniger et al, 2011; HLPE, 2011; and a recent meta-analysis by Vandergeten et al, 2016,).

More specifically related to EU policies, NGOs also claim that there are a significant number of cases of EU investors in developing countries which, according to them, were developed at the expense of subsistence agriculture.[25] Several of these investments were in response to changes in EU policies such as the provision of trade preferences (investments in sugar production) or increased support for bioenergy (investments in ethanol, palm oil,

[24] Recent studies find, in general, that trade openness has positive and significant impacts on food security (measured as dietary energy consumption and dietary diversity) (Dithmer and Abdulai, 2017) and is associated with reductions in child mortality in developing countries (Olper et al 2016).
[25] According to Knolte et al (2016), investment originating from the UK, the Netherlands, France, Jersey and Cyprus are involved in 315 concluded deals, covering nearly 7.3 million hectares.

jatropha production).[26]. The size and accuracy of this phenomenon remains unclear. The NGO coalition that monitors land deals concludes that some of them followed a process of obtaining prior consent and information, but that the majority of them were imposed on (and rejected by) local communities. Their survey also suggests that compensation and payments are provided only in a minority of cases, and that there are cases of forced eviction and displacement. Their conclusion on employment and overall benefits are mixed, since many of the projects lead to capital intensive agriculture with a low labor/land ratio (Knolte et al, 2016). However, Ecofys (2013) finds very little linkage between the EU demand for biodiesel and ethanol and land acquisitions, and their report challenges several cases put forward by NGOs. In addition studies on West African horticultural export to the EU show that these large-scale production systems are complementary to household farms and provide employment to the poorest with significant food security benefits and poverty reduction for local households (Maertens et al, 2012; Van den Broeck et al 2017). Clearly, more careful research is needed in this area.

The second line of criticism makes the contrary argument that the EU does not import enough from developing countries. Developing countries themselves, in particular through the G77 group, have often lamented that EU trade policy did not provide enough export opportunities for agricultural products, a sector in which many have comparative advantages. They consider that more export revenues would allow them to secure access to food through domestic policies as well as imports.

The EU used to impose tariffs on many commodities exported by developing countries, with the exception of mineral products and a few raw agricultural commodities. This is no longer the case. While the EU has maintained high tariffs on a Most Favored Nation basis (i.e. the regime that applies when there is no trade preference) on many agricultural goods, EU tariff protection has become very low for imports originating in developing countries. Over the last decades, the EU has granted developing countries many duty exemptions under a variety of agreements. The tariff preferences granted to Least Developed Countries under the *Everything But Arms* initiative, for example, are generous, in

[26] See GRAIN et al (2014), Oxfam (2016) and the many reports quoted by Vandergeten et al (2016) in their references. A survey of various issues raised by NGOs that involve investments related to the EU market can be found in Ecofys (2013).

terms of product coverage and preferential margins. The regime makes it possible for the 50 poorest countries to access the EU market without duties and quotas, and the EU Commission is keen to pointout that the EU is by far the largest export market for Less Developed Countries. Large access was also granted under a variety of reciprocal agreements, so that exports from most sub-Saharan Africa, Caribbean and the Pacific countries and several North African countries (e.g. Jordan) face minimal duties. In summary, the EU fortress has become quite "porous" for developing countries (Bureau and Jean, 2013).

Tariff preferences have a genuine impact on trade flows (Bureau *et al.*, 2016; Copenhagen Economics, 2016). The opportunity for export diversification depends on the agreements but is noticeable for some regional ones, including Mediterranean countries (Scoppola *et al.*, 2014). Positive, albeit limited, effects have been found for the poorest countries (Aghajanzadeh-Darzi *et al.*, 2016; Scoppola *et al.*, 2014). One reason is that the poorest countries are constrained in their exports to the EU by other factors, in particular product and process regulations (see also next section). For example, Least Developed Countries may hardly export any animal products to the EU, one of the many reasons is that they cannot demonstrate their capacity to deal quickly with a contagious disease outbreak (such as Foot and Mouth Disease, African swine fever, etc.). In practice, tariff free access has resulted in significant exports of only a narrow range of agricultural goods, such as sugar.

There are many interrogations regarding bilateral agreements, and in particular the recent *Economic Partnership Agreements* (EPAs) with African, Caribbean and Pacific countries. The budgetary consequences of the loss of tariff revenues for developing countries could endanger social policies, including some linked to food security. While in theory (and in the longer term) these revenue losses should be replaced by other forms of taxation, in practice this often does not happen, either because other taxable sectors have strong lobby power or because the institutional infrastructure is missing. However, studies that lament the loss in tariff revenues often neglect that in those countries there was often a poor rate of collection of import taxes.

The impact of competition from EU products for local producers remains disputed. One example is the difficulty of West African dairy producers to compete with imports

originating from EU and New Zealand.[27] Because the EPAs are reciprocal agreements, they have resulted in a reduction of tariffs imposed to EU exports in those regions that have concluded an EPA, which could make it more difficult for local producers to compete with imports. Overall, empirical impact assessments of the EPAs find mixed food security effects for some of the poorest countries which lack infrastructure to benefit from export opportunities and raise taxes that might replace tariff revenues (Aghajanzadeh-Darzi et al., 2016). One evidence of these mixed effects is that the negotiations before concluding the EPAs have been very difficult (they have stalled with the Central Africa region), there is still a strong reluctance to ratify and implement the various agreements in African partner countries (with the exception of the EPA with Cariforum).

Finally, it is worth mentioning the EU's role in helping to create a rules-based international trade regime under the WTO, which is an important instrument for global food security. The EU played a distinctly regressive role at the start of the Uruguay Round and even at the start of the Doha Round, with its reluctance to contemplate the elimination of export subsidies in particular. In more recent years the EU has played a more constructive role. An illustration is its joint proposal with Brazil to eliminate export subsidies at the Nairobi WTO Ministerial in 2015, and, more recently, to base domestic support discipline on the value of production rather than on historical references that tend to discriminate against developing countries (Matthews, 2017).

7. EU Food Standards and Global Value Chains [28]

EU consumers in the 21st century are particularly concerned about the safety and quality of food. The EU food safety policies aim to protect consumer health through a farm-to-fork safety approach, imposing traceability requirements throughout EU food chains (while

[27] In large West African cities such as Dakar, the dairy industry relies a lot on imported milkpowder. Local producers suffer from poor transportation and storage infrastructure for fluid milk, and sometimes from an unfavorable tax system (Senegal). See Diarra et al (2013).

[28] An issue which has been very controversial but which we do not cover explicitly as a separate issue is EU rules on GMOs. At this point, EU GMO regulations affect mostly EU agricultural production activities. There is an argument that these regulations also affect developing countries' food security through trade and through regulatory spillovers (see e.g. Vigani et al, 2012).

taking into account international agreements, such as the Sanitary and Phytosanitary and Technical Barriers to Trade agreements under the WTO).[29] The growth and spread of these food standards has triggered (a) a strong debate in trade policy on the extent to which these standards are new protectionist instruments, i.e. so-called Non-Tariff Barriers or NTBs (Beghin, 2013); and (b) in development policy about the potential detrimental effects of these standards on poor farmers in developing countries which risk to be marginalized (Reardon *et al.*, 2003; Swinnen 2016).

Some EU standards have been introduced to keep imports out and protect EU producers, but in most cases technical and sanitary regulations are introduced to protect consumers (Beghin et al, 2015). Yet, even in this case, regulations can represent obstacles for would be exporters from developing countries (Swinnen 2017). EU standards entail costs and can restrict trade, diminishing export opportunities for developing countries. However, by providing a bridge between consumer concerns and preferences in EU countries and producers in developing countries, food standards can also be catalysts to developing countries' participation in trade (Maertens and Swinnen 2007). EU standards can certification schemes can reduce transaction costs and enhance consumer confidence in food product safety and quality. Several developing countries have been successful in complying with standards and ensuring their competitive position in high-value international markets (Jaffee and Henson, 2005).

EU imports from developing countries have increased sharply during the past decades at the same time as food standards have become more stringent. Moreover, the import growth has been strongest in sectors with higher value products where standards are most stringent, such as fruits, vegetables, seafood, fish, meat and dairy products (Maertens and Swinnen, 2014). These observations may suggest that the standards have not restricted trade (much) and/or that they helped developing countries in accessing EU markets; but they may also

[29] Not only has the public sector responded to the crises, but there has also been a rapid growth in private sector initiatives in the field of food safety and quality standards. Private standards are often more stringent than public ones (Fulponi, 2007; Vandemoortele & Deconinck, 2014). These include the GlobalGAP standard which is now used by a large number of the major retailers in the EU (and the world).[30] Also with respect to the costs of compliance and certification to private standards, evidence is mixed. Asfaw et al. (2010) measure the investment costs related to GlobalGAP to represent 30% of annual crop income for smallholders in Kenya, while the estimates by Graffham *et al.* (2007) differ enormously across different firms or farmer groups. See also Chiputwa and Qaim (2016).

suggest that increasing exports have induced protectionist responses in the EU to introduce standards as NTBs. Careful analysis of the causal impact is difficult due to conceptual and empirical complexities (Beghin and Marette 2010; Swinnen and Vandemoortele 2015; Van Tongeren et al 2009). Some studies find evidence of high compliance costs with EU food standards, which are especially problematic for small producers and developing countries, while other studies have estimated that the costs of compliance are only a small fraction of total production costs (Aloui and Kenny 2005; Beghin 2017; Curzi et al 2017; Fernandes et al 2017).[30] In many cases, compliance and certification costs are largely carried by exporters or by donor support (e.g. Subervie and Vagneron 2013; Kersting and Wollni 2012). In an elaborate review of the literature, Beghin *et al.* (2015) conclude that there is mixed empirical evidence and that EU food standards can be, but are not necessarily, protectionist.

An important way through which rural farm-households in developing countries can benefit from agri-food exports and the increased value in export sectors is through participating in value chains with exporters or overseas buyers. But whether or not smallholder farmers do share in the benefits from trade depends on the extent to which they are included in contract-farming arrangement and the impact that participation in contract-farming has on their incomes and well-being. Here too, the empirical evidence is mixed (Maertens *et al.*, 2012; Reardon *et al.*, 2009). Several empirical studies have documented that with increasing standards, a decreasing share of export produce is sourced from small farmers. Yet, other studies show that smallholders continue to be included in modern value chains, sometimes exclusively. Other studies find evidence that once farmers are included in contract schemes and high-value export chains, they benefit significantly.[31]

A much overlooked issue in the welfare analyses of agri-food trade is that poor households may benefit through employment effects. High-standards trade creates new

[30] Also with respect to the costs of compliance and certification to private standards, evidence is mixed. Asfaw et al. (2010) measure the investment costs related to GlobalGAP to represent 30% of annual crop income for smallholders in Kenya, while the estimates by Graffham *et al.* (2007) differ enormously across different firms or farmer groups. See also Chiputwa and Qaim (2016).

[31] Maertens and Swinnen (2009) and Minten et al (2009) show major reductions in hunger and poverty from participation in horticultural value chains in Senegal and Madagascar. Handschuch *et al.* (2013), Asfaw *et al.* (2009) and Subervie and Vagneron (2013) find that smallholders' certification to GlobalGAP results in improved quality, increased volumes, higher farm-gate prices and higher net incomes from fruit or vegetable production for respectively Chile, Kenya and Madagascar.

employment opportunities in labour-intensive processing and handling of produce, and on vertically integrated estate farms and large contracted farms. A shift from smallholder contract-farming to vertical integrated estate farming also entails a shift from production based on family labour to production based on hired labour. Employment in agro-industrial production and exporting companies is well-accessible for the poor and this employment appears to have a large positive effect on household incomes and food security.[32]

9. Conclusion

We reviewed studies on the impact of EU policies on global food security. Given the size limits of this review, we focused on EU agricultural policy, bioenergy policy, trade policy, and development (food aid) policy. In the past, the CAP and EU trade and food aid policies were heavily restricting imports from developing countries and subsidizing EU exports, thereby affecting developing countries' food security directly or indirectly through global prices. However, much has changed in the past 20 years.

The most distortive policy elements have been substantially reformed and/or removed. While the EU still massively subsidizes its agriculture, the impact on global agricultural and food prices is limited because of a shift from subsidizing production to subsidizing farm incomes. While such subsidies do eventually impact production, they are far less detrimental for developing countries producers than the former production coupled payments and export refunds. And the overall production enhancing effect of such direct payments is likely to be offset by cross compliance and other eligibility conditions, and by Pillar 2 payments that favor more extensive production. In addition, the provision of in-kind food aid has been significantly reduced, and replaced by different forms of development aid which are less distortive to developing countries' farmers markets. These reforms have contributed to higher prices on international markets. In brief, neither the EU agricultural policy nor the EU food aid policy have a considerable impact on world markets. And they no longer have significant

[32] Recent empirical studies have documented that the development of such high value agro-industrial value chains creates substantial employment, for example in vegetable export sector in West Africa (Maertens and Swinnen, 2009; Maertens *et al*. 2012; Vandenbroeck *et al.*, 2017) and in the cut flower industry in East Africa (Mano *et al.*, 2011), with benefits for food security (Van den Broeck and Maertens, 2017).

negative consequences for food security. The recent reforms have largely reduced the negative consequences of the CAP for food security.

Increased support to EU biofuels has also tended to push global prices upwards, although the impact is likely limited (compared to e.g. biofuel programs in the US). The nature of the compulsory mandate set by the Renewable Fuel Directive, set in terms of percentage of fuel used in transport fuel, may result in a rigid demand that contributes to greater price instability. However, recent and ongoing changes in this Directive limit this phenomenon.

EU trade policy has also been reformed to remove export subsidies and developing countries have now much better access to the EU markets than in the past. The EU grants preferential treatment of exports from poor countries, helping them to find outlets for their market, in spite of many sanitary and regulatory obstacles. This has, overall, a positive impact on food security in these countries, through income generation and job creation.

As EU policy reforms reduced its depressing impact on global markets in the 2000s, food prices spiked, raising concerns about the impact of high versus low food prices on food security. The price spikes changed the public debate about how policies that lowered agricultural prices (e.g. former CAP subsidies and EU export refunds) or pushed them up (e.g. EU support to biofuel) were good or bad for food security. In response, a series of careful empirical studies and simulations have shown that the impact confirms basic economic principles: i.e. that the impact depends on whether poor households are buyers/sellers of food and whether poor countries are importers/exporters of food. Most studies show that the aggregate net effect of higher agricultural prices has benefited aggregate food security and poverty reduction in the world, but that the impact at the country and regional level is heterogeneous (reflecting their production and consumption patterns). Even though a large share of poor farmers are net buyers of food, and are hit by higher prices as urban consumers are, steady agricultural prices stimulated revenues and investment in agriculture, and tend to have a positive impact on food security in the long run. In the future this aggregate effect will be affected by structural transformations of developing economies and urbanization -- implying (relatively) more consumers and less producers – although poverty and food insecurity may remain disproportionately concentrated in rural areas.

Overall, a recurring theme from our review is that the impact of EU policies on global food security today is less obvious and more complex/nuanced than often argued. That said,

there are still causes for concern. First, when the EU adjusts its cereals tariff downwards to protect its livestock producers in case of high feedstock prices, it contributes to fueling the rise in world prices. This, and what remains of the blending mandate for first generation biofuel, feeds price fluctuations. Such fluctuations are detrimental to risk-averse consumers and producers who try to invest and sell agricultural products but have difficulty coping with volatile markets. Second, while the EU biofuel policy may enhance income and reduce malnutrition for poor households working in the palm oil sector, there remains concern about the impact of the expansion of palm plantations throughout the world. In several countries (Asia, but increasingly South America and Africa), the way these plantations expand seem to result in large scale destruction of natural capital and future production potential, even though evidence of the global impact on employment and income is controversial.

Third, EU food standards have a major impact on trade and global value chains. At the same time they create obstacles and opportunities for developing countries to benefit from access to (rich) EU consumer markets. Empirical evidence documents a mixture of effects in terms of protectionist impacts and of how the institutional organization of global value chains has adopted to address ever tightening public and private EU standards regarding safety, quality, sustainability and social conditions. Export value chains include both smallholder sourcing systems as large scale production systems where poor households are employed. In general, studies show that households benefit from inclusion in these value chains, either directly through increased incomes from employment or from contract farming, or indirectly from spillover effects on household farm productivity through better access to inputs and technology.

The complexity of the impact of current EU policies on global food security also requires complex and comprehensive methods and datasets to measure how the policies affect the availability, access and utilization dimensions of food security. This includes a more extensive global impact assessment of EU sectoral policies, which complement traditional economic and sustainability impact assessments (e.g. standard life cycle analyses) by assessment of global, indirect effects, such as in the area of land and water use changes. This also relates to policies which, at first sight, are not intended for international markets. One example is EU food standards. Another example is recent policy ideas that aim at reducing the negative externalities generated by intensive agriculture in the EU. Indeed, while such policies may contribute to positive environmental benefits in the EU, e.g. by reducing

significantly fertilizer use, they will also reduce agricultural yields and, unless accompanied by changes in consumption (e.g. shifting to a more vegetarian diet, reducing food waste, etc.), this will lead increased demand on world markets *ceteris paribus*. In such situation, indirect effects might take place, for example in terms of higher world prices or new land put in agricultural production to respond to higher demand addressed to world markets. Such indirect global effects could affect food security in other parts of the world in a complex way, since they would cascade across products and markets (Amani et al, 2013; Bellora and Bureau, 2016).

It is necessary that local actions be considered with their global impact. For that purpose, economic modeling of EU agricultural, environmental and trade policies is required in order to complement traditional sustainability impact assessments (e.g. standard life cycle analyses) by assessment of global economic effects.

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