



Policy Briefing

AGRICULTURE AS A PROVIDER OF NON-FOOD PRODUCTS

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The fact that agriculture is a provider of non-food products is not new. Agriculture, including animal rearing and forestry, has traditionally been a source of fibres, fuel, construction and other materials like hides and skins.

What is new is the scale and the range of products originating in basic agricultural raw materials, creating new important outlays for farmers and for the agri-industrial sector at large.

This paper aims at providing an overview of this promising area, and at underlining its significance for the economy of the sector.

Other than the traditional uses of agricultural, forestry and livestock raw materials that remain significant, new uses have developed at great speed in the last decades.

To name a few of the more illustrative examples: the large scale use of feedstock and biomass to produce biofuels, the use of oilseeds to produce oleo-chemical products, the expansion on the use of starch in a wide range of products including polymers for biodegradable plastics, or the expansion on the use of fibres in the textile and automotive industry.

Fuel, fibres, starch, oils, solvents, dyes, resins, proteins, speciality chemicals and pharmaceuticals, are today to various degrees of biological, agriculture origin.

These products present significant advantages as compared to similar products from other origins, as for instance fossil fuels:

- they benefit the environment by reducing greenhouse gases
- they cut waste and pollution
- they produce social benefits by stimulating rural communities through establishment of local industries and providing new markets for farmers
- they improve the economic competitiveness of the agri-industry through development of new markets and products

This bio-economy is also a large provider of employment outside the primary agricultural sector: in the EU non-food bio-based products account for 2.7 million jobs, which is a figure that by itself shows how relevant the bio-economy is nowadays.

STARCH, OLEO-CHEMICALS AND FIBRES

Plants can synthesise an immense range of compounds. As 'cell factories' they contain structures which can be used by the physical, chemical and biochemical sciences to produce useful materials as fibres, starch, oils, solvents, dyes, resins, proteins, speciality chemicals and pharmaceuticals.

Some non-food crop uses such as textiles are widely known. Others may be less familiar such as plastics made from starch-based polymers. There are implications for consumer behaviour – for example in choice of 'green' products, and co-operating with waste disposal strategies to realise the benefits of biodegradable materials.

Many industrial applications of crop materials are already in use. For example it has been estimated that 15% of global oleo chemical production from plants enters non-food markets. About half of the 9m tonnes of starch produced in the EU from maize, wheat and potatoes is used for non-food purposes. In recent years there has been a strong increase in interest in particular applications, such as the use of natural fibres in building construction and as a replacement for fibreglass in composite materials for example in vehicle manufacture. Some of these are bulk applications while others are of particular interest to small and medium-sized enterprises seeking highly innovative specialised markets.

To give an idea of the significance of these new outlays to farmers, who are the producers of the raw materials, just to produce starch and oleo-chemicals more than 1.2 million ha were planted in the EU. This is an area similar to the whole utilised agriculture land in Belgium, by far and large not a marginal figure.

By the same token, the share of green, renewable and biodegradable products is far from negligible in the EU. The lead example comes from surfactants, where the share of renewable products in total consumption is over 50%. There is also a growing market for renewable lubricants, solvents and polymers.

Physical, chemical and genetic sciences can combine to produce new applications. Research in this promising field is a must, and the European Commission should be encouraged to dedicate adequate resources to the development of new non-food uses of agriculture production.

BIOFUELS

One of the most striking examples of non-food uses of agriculture raw material is biofuel, in particular the use of rapeseed to produce biodiesel and of maize, wheat and sugar to produce bioethanol.

In 2014, 13 million tonnes of biofuels were produced in Europe. Biodiesel made up 72% of this total, while bioethanol reached 28%.

Biodiesel

Biodiesel is a renewable fuel that can be produced from domestically cultivated and processed oilseeds (rapeseed mainly, sunflower seeds and soybeans). Today, biodiesel produced in the EU derives first from rapeseed, accounting for 55% of total production in 2014, and 49% in 2015.

Rapeseed used for the production of biodiesel is cultivated within the EU as a break-crop, which means basically that the agricultural product is grown after a sequence of cereal cultivation and plays a vital role in diversifying production, preventing plant diseases, managing weed and pest levels, restoring essential soil nutrient and nitrogen balance, and improving soil structure.

The introduction of alternative species (break-crops) into the cropping sequence boosts yield and reduce the need of inputs for the following crops. Indeed, rapeseed cultivation reduces the need for fertilisers, contributing in this way to the GHG reduction target.

However, its share in the feedstock mix has considerably decreased compared to the nearly 100% in the early stage and even around 60% in 2012. This is mostly due to higher use of imported palm oil linked to new plants using HVO (hydrogenated vegetable oil).

Use of palm oil for biodiesel in Europe has grown to over 3 million tons per annum contributing to the expansion of palm oil deforestation in Sumatra and Indonesia,

undermining valuable efforts engaged in the food sector to focus on certified palm oil production and fight against the expansion of unsustainable production.

Recycled vegetable oil/used cooking oil (UCO), is also being produced locally, but with a growing part being imported (UCO was the third most important biodiesel feedstock in 2015).

Contradictions around the use of UCO as an advanced biofuel arise in part because collectable UCO volumes in Europe amount to just a couple of litres per person per year or less than 1% of the amount of diesel fuel consumed per person on Europe's roads.

Hence UCO imports will make up the majority of supply in any market in which UCO biodiesel is a growing biofuel. This is significant because UCO outside the EU is generally not a waste and is used for both feed and fuel. Its preferential use in Europe as a non-feed "waste" is thus highly questionable and appears to contradict the Waste Framework Directive's instruction never to create waste if that is avoidable.

Bioethanol

In Europe, maize is the main feedstock used to produce renewable ethanol (5.4 million tonnes) followed by wheat and sugar, with almost all from European origin. As a practical matter, the EU ethanol industry no longer imports its feedstock from outside Europe.

In addition to that the EU's ethanol bio refineries are the most advanced in the world in terms of co-products, producing an expanding array of high value bio economy products every year. Whereas in 2009 the most advanced ethanol bio refineries in Europe produced only animal feed and ethanol, today they produce ethanol, animal feed, vegetable oil, nutraceutical products, various products for human food, bio-electricity, fertilizer and other products.

The EU legal framework

The European Commission has made a proposal in the context of a revised RED (Renewable Energy Directive) that would phase out to a large extent the production of conventional or first-generation biofuels, produced from feedstock.

Nevertheless, facts are very clear: EU sourced biofuels have no negative impacts on food availability and prices. On the contrary, they have a positive impact on agricultural land, environment and transport decarbonisation.

1) *Not only European sourced biofuels have not displaced any food and feed production...*

Since 2008 EU biofuels production increased by 68% while global food prices dropped by 20%.

If one looks more closely to the relationship between the production of conventional biofuels in the EU and the availability of food and feed, the facts are that the EU production of the main feedstocks used for producing biofuels (rapeseed, wheat, maize and sugar) has either increased or remained stable (by quotas in the case of sugar), due to productivity gains.

European sourced biofuels have not displaced food and feed production, and have had no real impact on prices. On the contrary biofuels have helped in limiting the adverse effects of the food markets U-turn, offering some economic stability to struggling EU farmers, without adverse effects on food or feed availability. It is estimated that the production of crop-based biofuels in the EU generates at least 6.6 billion euros of direct revenue for EU farmers.

In addition, the bioethanol industry is said to have created 70 000 direct and indirect jobs since the EU introduced its biofuels policy, while the biodiesel sector has generated 220 000 direct and indirect jobs in the EU biodiesel production chain.

2) *But they improve European and global food security...*

There is another very important positive impact of biofuels production in the EU – the production of protein feed as a by-product.

Europe is still dependent for 70% of soybean meal imports to meet its growing livestock demand. The EU biofuels industry processing rapeseed and cereals now produces approximately 13 million tonnes annually of high protein meals that otherwise would be imported from the Americas.

It should be noted that less imports from the Americas mean more feed and food availability from these regions, to the benefit of consumers all over the world, thus contributing to increased global food security.

3) *EU biofuels produced from EU feedstock provide immediate and efficient answer to transport decarbonisation...*

Moving on to the crucial issue of the climate benefits of biofuels as compared to the use of fossil fuels, the fact is that transport is responsible for 25% of GHG emissions in Europe. This sector is at the heart of the climate challenge and biofuels are an alternative to fossil fuels.

Biofuels in the EU must conform to strict sustainability criteria to ensure that their production and use do not cause any harm to the environment. These criteria include a minimum rate of direct greenhouse gas emission savings (35% in comparison to fossil fuels in 2009, and rising to 50% in 2018) and restrictions on the types of land that may be converted to production of biofuels feedstock crops. Currently biofuels produced in the EU from EU feedstock achieve even better results.

In spite of the climate and economic benefits of conventional biofuels production, and the lack of negative impacts on the availability of food and feed, the Commission is proposing to limit its use to a maximum of 3.8% of the total energy consumption in the EU by 2030. Worth recalling that today the EU has a target of 7% use of biofuels in the transport sector.

4) The Commission is proposing to scale down the production of conventional biofuels, without any facts or analysis that would support its proposals.

Its proposal put at stake as well the emergence of second generation biofuels which development needs support of a strong conventional biofuels sector.

To make it even more unacceptable, the Commission seems to ignore that today the EU is a net importer of biofuels. Well informed decisions to promote balanced and locally sourced biofuels in the EU will mean that for every additional production of locally sourced biofuels, there would be a corresponding decrease of imports of biofuels produced in third countries with uncertain sustainability practices. There will be a decrease in feedstocks produced in third countries to be exported to the EU to produce biofuels and a decrease of feed meals imported into the EU from third countries. Moreover, those third countries could use the freed-up land resources for afforestation and food security purposes.

Amongst the imported biofuels, palm oil comes first. As a result of the 2012 Commission's proposal on "crop-based biofuels", the EU has been locked into strong levels of increasing imports into Europe.

The one consensus element, arising from all the scientific data, is the negative impact of unsustainable palm oil, especially in the context of deforestation of highly diverse and carbon rich ecosystems. Use of palm oil for biodiesel in Europe has grown thus contributing to the expansion of palm oil deforestation in Sumatra and Indonesia.

RED II should adequately respond to these concerns in the use of palm-oil based biofuels in the EU, instead of curtailing the production of sustainable EU based biofuels.

EU sourced biofuels cogenerating proteins are to be promoted if the objective is truly to fight climate change while improving food security and job creation.

Indeed, it is high time to get back to facts and confront populist positions that attempt to equate conventional biofuels to hunger and deprivation. On the contrary, conventional biofuels are a source of job creation and increased incomes, improving food security.

The debate on the current Commission proposals should make the targets for the use of renewable energy in transport more ambitious, not erase them. In addition to that, the sustainability criteria for feedstock originating biofuels should promote those that deliver protein feed, replacing imports, and freeing-up land in third countries for food and feed production or environmental improvement, on top of their emissions savings.

That would benefit the environment, create jobs and growth, diminish EU dependency on imports of protein feed and oil, and improve food security overall.

CONCLUSION

Agriculture, including forestry and animal rearing, has always been a provider of non-food products, a source of fibres, fuel, construction and other materials like hides and skins.

What is new is the scale and the range of products originating in basic agriculture raw materials, creating new important outlays for farmers and for the agri-industrial sector at large, and the speed at which they have developed in recent times.

The bio-economy brings 2.7 million jobs to the EU, outside those employed in the farming sector providing the raw materials for non-food uses.

These products present significant advantages as compared to similar products from other origins, as for instance fossil fuels, as they benefit the environment by reducing greenhouse gases, cut waste and pollution, produce social benefits by stimulating rural communities through establishment of local industries and providing new markets for farmers, and improve the economic competitiveness of the agri-industry through development of new markets and products.

Agriculture land has been used in the EU to a significant extent to generate non-food products, be it biofuels, starch, oleo-chemicals or fibres, without reducing the availability of food or feed, nor having a negative impact on consumer prices. The starch and oleo-chemicals production alone mobilize over 1.2 million ha, whilst at the same time food and feed production have increased as a result of productivity gains.

Non-food production contributes positively to farmers revenues, creates jobs in less-favoured rural areas, and increases the competitiveness of the agri-industry sector. Non-food production is a well-diversified sub-sector, with a promising future.

Public policies should encourage the development of the bio-economy, through applied research and other means. Public policies should in particular be based on facts and extend and strengthen existing mandates for biofuels, and thus contribute to decarbonisation of transport fuels.