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External governance and the EU policy for sustainable biofuels, the case of Mozambique

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ABSTRACT

Growing demand for transport biofuels in the EU is driving an expansion of the industry in developing countries. Large-scale production of energy crops for biofuel, if mismanaged, could cause detrimental environmental and social impacts. The aim of this study is to examine whether the newly adopted EU Directive 2009/28/EC and its sustainability certification system can effectively ensure sustainable production of biofuels outside the EU. Mozambique, a least developed country with biofuels ambitions, is selected as empirical case. The effectiveness of the EU policy in analysed employing ideal models of external governance (hierarchical, market and network governance) as analytical framework. The findings show that the EU attempts to impose its rules and values on sustainable biofuels using its leverage through trade. The market approach adopted by the EU is expected to produce only *unstable* (subject to abrupt changes of market prices and demand) and *thin* (limited to climate and biodiversity issues) policy results. Stronger emphasis on a network oriented approach based on substantial involvement of foreign actors, and on international policy legitimacy is suggested as a way forward.
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1. Introduction

Recent years have witnessed a sharp expansion of interest in transport biofuels, in the form of bioethanol, from sugar and starch crops, and biodiesel from vegetable oils. This growth of interest is driven by governments' support for biofuels consumption and production, driven in turn by concerns about high oil prices, prospects for rural development and means to mitigate climate change. It is claimed that biofuels could ease all these concerns and thus have a unique role to play in the European energy policy (EC, 2007a).

A wide range of potential risks connected to biofuels has been underestimated, or neglected by policy makers. Growing evidence shows that, if mismanaged, large scale production of biofuels feedstock could be fossil fuel intensive, exhaust soil nutrients, exacerbate erosion, deplete and degrade water resources, reduce biodiversity by displacing habitat, increase greenhouse gas (GHG) emissions and compete with food production (see, for example, OECD, 2007; UNEP, 2009). In particular, these risks are associated with large-scale production in developing countries. In response to these issues, the EU has recently adopted a new Directive (EU, 2009) that, while fostering demand of biofuels in the Union, introduces a system to ensure their sustainable production in the EU and elsewhere. However, the lack of EU jurisdiction to enforce compliance in third countries, combined with the challenges of sustainable production of biofuels, put the goal achievement capacity of the EU Directive into question.

The aim of this study is to evaluate to what extent the sustainability system of Directive 2009/30/EC can effectively ensure sustainable production of biofuels outside the EU, and to suggest a way forward for policy makers. An effective system is deemed to be one that covers the most relevant sustainability aspects linked to the production of biofuels, and that is widely applied outside the EU. This last element, policy application outside the EU territory, is the focus of the study and is addressed evaluating the mode of EU external governance, i.e., the way the scope of the EU policy is expanded to include non-EU countries. The mode of external governance is analysed by examining the policy-making process at EU level and the distributive effects of the policy at domestic level employing ideal models of external governance found in the literature as analytical framework.

Mozambique, a least developed country with biofuel ambitions, and large production and export potentials, is selected as an empirical case representing one of the numerous tropical developing countries currently planning for large-scale production of biofuels. The case study is based primarily on open interviews with administrative officials of the Mozambican government and of the European Commission.[1] The function of

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[1] Representatives from the Mozambican Ministry of Agriculture and the Ministry of energy, as well as from the EC (DG TREN) were interviewed. Members

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the interviews is to allow a deeper understanding of the EU Directive in relation to the development of the issue of biofuels in Mozambique. Interviews are complemented with secondary data from published reports and scientific studies. In particular, market data, prices and volumes and biofuel policies of selected countries are qualitatively analysed to assess the potentials of export markets for Mozambican biofuel producers.

2. EU external governance and its modes

The impact of the EU and its policies at national level has been the focus of intense research in recent years. Europeanization research has focused on the impacts of EU directives and regulations on domestic politics, policies and administrative structures of member states (see, e.g., Borzel and Risse, 2003; Di Lucia and Kronsell, 2010; Knill, 2005; Knill and Lehmkuhl, 2002). More recently the attention of scholars interested in Europeanization has also included the impact of the EU in countries applying for membership (see, e.g., Grabbe, 2003; Schimmelfennig and Sedelmeier, 2004). Much less attention has been paid to the impact in countries that are not interested, or have no chance of joining the EU. This novel perspective on EU external governance seeks to capture the expanding scope of EU rules beyond EU borders (Bauer et al., 2007; Lavenex, 2004; Lavanex and Schimmelfennig, 2009; Lavenex and Uçarer, 2004). The notion of governance, understood as a broad term which encompasses all the purposeful mechanisms and measures aimed at steering social systems (Jagers and Stripple, 2003), is particularly suitable to grasp the process of rule's expansion beyond EU formal membership. This research has developed a framework which highlights three ideal modes of governance (hierarchy, networks and markets) to account for both the internal and external impacts of Europeanization, regardless of whether the country in question is a member state, applicant state, or state with no interest or chance of joining the EU. These are heuristic devices which cannot fully imitate the complexity of the empirical reality where modes often work simultaneously.

In a nutshell, *hierarchical governance* is a form of steering based on formal and precise rules that are non-negotiable and legally binding as well as enforceable upon actors (Lavanex and Schimmelfennig, 2009). Europeanization through hierarchy, or by compliance (Bauer et al., 2007), is a coercive mechanism where legally binding rules are implemented by national governments to avoid sanctions. In the context of EU external relations, this form of governance comes close to a system in which countries agree to comply with legal obligations defined in multilateral or bilateral agreements (Knill and Tosun, 2009). In the case at hand, the possibility of international agreements is examined with reference to the content of the EU Directive and the position of the European Commission (EC).

Network governance brings about change as a result of coordination efforts, voluntary negotiations and bargaining. This mode of governance, similar to what Bauer et al. (2007) describe as communication, is marked by its openness and its emphasis on the principles of voluntary participation and mutual learning. The rationality behind the communicative approach is to secure and increase the legitimacy of particular models, through deliberative processes, co-ownership and dense interaction, in order to advance Europeanization (Schimmelfennig and Sedelmeier, 2004). Legitimacy provides an internal reason for an actor to follow a rule because it is perceived as appropriate in light of actor's values and norms (Hurd, 1999). At international level, non-member states might adopt and apply EU rules if they regard them as appropriate in light of their values and norms (Schimmelfennig and Sedelmeier, 2004). This can be triggered by providing an institutionalized organization for communication and policy learning either through intergovernmental interactions, or through transnational processes via societal actors (Schimmelfennig and Sedelmeier, 2005: 11–12, 18). In these settings, network governance implies that an expansion of the regulatory boundary (scope) of EU rules is accompanied by an expansion of the organizational boundary opening-up EU policy-making structures to foreign actors through participatory and inclusive decision-making. The extent and quality of such organizational expansion is examined in this study through a detailed analysis of the decision-making process of the EU Directive.

Market governance is the third major mode of governance. Here change is the result of competition between formally autonomous actors rather than hierarchical harmonization, or networked coordination (Lavanex and Schimmelfennig, 2009). The adoption and application of EU rules take place in non-member states on a voluntary basis and the potential impacts foremost depend on the interest of foreign actors in participating in the EU market (Bauer et al., 2007). To account for such implications this study examines the benefits and burdens that the application of the EU policy is expected to create for Mozambican actors. Market access can function as an important instrument to promote domestic change, as in the case of environmental standards as suggested by Knill and Tosun (2009). However, rules that impose burdens greater than benefits risk to be domestically contested and, eventually, rejected (Knill et al., 2008).

Scholars interested in external governance have also dedicated attention to the issue of effectiveness. In general terms, the effectiveness of external governance can be interpreted either as the level of rule selection in international negotiations and agreements, as rule adoption in domestic legislation, or as rule application in domestic practice. In this study the effectiveness of external governance is treated as the application of EU rules in domestic practice. However, the most interesting question, the conditions under which external governance is effective, has been inadequately investigated (Lavanex and Schimmelfennig, 2009). In a recent study, Lavanex and Schimmelfennig (2009) summarize the findings of a coordinated research endeavor which explores the effectiveness of EU external governance treated as rule adoption in domestic legislation.[2] The researchers examine a set of explanations contrasting institutional hypotheses with power-based and domestic structure explanations. In particular, the institutional hypotheses suggest that effectiveness is determined by rule's legalization and legitimacy which means that precise, binding and enforceable EU rules (legalization) and rules that are in line with international rules beyond the EU (legitimacy), are more likely to be adopted behind EU borders. However, these studies are specialized on individual policies, third countries and explanations, and suggest only tentative conclusions so that none of the hypotheses can be safely discarded.

3. The EU policy for sustainable biofuels

The EU policy for sustainable biofuels and the debate around it are described in this section. The first Biofuels Directive (EU, 2003) promoted the use of biofuels simply by setting indicative

(*footnote continued*)
of the civil society and of the biofuels industry in Mozambique were also consulted during a workshop on sustainable biofuels in Mozambique organized in 2007 by the Ministry of Agriculture.

[2] These studies are published in a special issue of the Journal of European Public Policy, European Union external governance, 16: 6 (2009).

consumption targets for the EU member states (2% by 2005 and 5.75% in 2010 as share of energy consumption in transport). A review of the 2003 Directive started in 2007 (EC, 2007a) leading up to the adoption of Directive 2009/28/EC in 2009. The new Directive draws an explicit link between consumption of biofuels and their sustainable production. It establishes a mandatory target of 10% renewable fuels in the transport sector of each member state by 2020, and a certification system to ensure that only sustainable biofuels are counted to achieve the target.

Concerning the sustainability of biofuels, the Directive creates a certification system composed of a set of sustainability criteria (Art. 17) and verification and reporting rules (Art. 18). The sustainability criteria include (i) *GHG emissions saving*: the use of biofuels shall ensure at least 35% savings of GHG emissions compared to fossil fuels (increasing to 50% from 2017); (ii) *protection of high biodiversity areas*: feedstock shall not be obtained from land with high biodiversity value, e.g., forests, highly biodiverse grasslands and nature protection areas; (iii) *protection of high carbon stock areas*: feedstock shall not be obtained from land with large quantities of carbon stored in the ground, e.g., wetlands and continuously forested areas. All these criteria apply to imported as well as EU-produced biofuels.[3] However, trade and consumption of biofuels not in compliance with the Directive's system are not forbidden, but simply discouraged. Compliance with the Directive's criteria must be verified and Art. 18 requires member states to collect reliable information for each consignment of biofuels, or raw material, employing a mass balance system and to ensure that information is audited by an independent party.[4] Member states are responsible for the organization of verification and reporting activities, but are prevented from introducing additional, differing, or more stringent sustainability requirements (Art. 17.8).

The EU biofuels policy has been the subject of intense debate. At the heart of the discussions are both the scale of the planned expansion, the 10% target, and the capacity to increase production without unacceptable negative impacts on society and the environment (OECD, 2007; UKRFA, 2008). Although the introduction of the EU sustainability system is a response to these concerns, its criteria cover only few of the sustainability issues referred to in the literature on sustainable biofuels (see, e.g., RSB, 2009). Specifically, the EU system overlooks potential impacts on people and society. Studies have shown that biofuels might be less beneficial to the social and economic development of local communities than previously suggested, and concerns are raised that biofuels production may result in, or exacerbate, poor labor practices, especially in developing countries. The absence of social standards in the EU system is due to adherence to international trade rules since it is believed that process and production methods (PPMs) standards related to social and labor issues would impose unjustified trade barriers in violation of international trade regulations (EC, 2008a). If made mandatory, social criteria would discriminate between *like* products.[5] Whether socially sustainable biofuels are *like* conventional biofuels remains an open question that can be answered only by a dispute panel, under the dispute settlement system of the World Trade Organization. In a similar way, the EU Directive recognizes, but does not act upon the risks that biofuels production poses to the local environment in third countries, except for biodiversity losses. The cultivation of the feedstock might trigger environmental problems typically associated with large-scale agricultural production, such as water, air and soil pollution and degradation, due to the use of artificial fertilizers, pesticides and open-air burning. However, the EC's view is that such requirements would also be in conflict with WTO rules (EC, 2008a). In contrast, climate and biodiversity criteria might be justifiable under Art. 20 GATT since those are global environmental issues recognized in international treaties (Howse et al., 2006).

Undoubtedly the greatest concern with large-scale production of biofuels is the impact of feedstock production on the use of land and on food markets. Feedstock production might cause both direct (dLUC) and indirect (iLUC) land-use changes (for a description see WBGU, 2008). dLUC arise when energy crops directly replace food or fodder production, or expand into natural areas, whereas iLUC appear when the previous use of land is displaced elsewhere. iLUC work at macro-economic level and are induced by, but geographically separated from the expansion of energy crops. The result is that to maintain food and fodder production volumes productivity on existing agricultural land needs to be increased or further land developed as cropland or pasture land. The EU Directive, once again, only requires the EC to monitor and report on the impacts that the expansion of biofuels production has on food markets, commodity prices and food security in producing regions. These types of impacts are not covered under the EU sustainability system since off-farm, macro-economic interactions of land-use for food, fodder and energy production cannot be effectively addressed by certification systems working at consignment level such as the EU system. A suitable methodology should be developed by the EC by the end of 2010 (Art. 19.6). However, to date there is no scientific consensus as to how to quantify and control iLUC.

4. The case of Mozambique

The case of Mozambique is employed in this study to evaluate the external governance of the EU policy for sustainable biofuels. The country has very little experience with biofuels, but it is considered a promising region due to the relative abundance of land and water resources, favourable climatic conditions and low population density (Batidzirai et al., 2006; Econergy, 2008). Located in the eastern part of southern Africa, Mozambique is one of the fastest growing economies in the region. Still Mozambique is one of the poorest countries in the world and a 'Least Developed Country' by UN parameters (UN-DESA, 2008), where approximately 80% of the population is employed in agriculture and related activities (World Bank, 2009). The low productivity of the agriculture sector, mainly due to limited use of irrigation and agricultural technologies, e.g., artificial fertilisers and pesticides (Coughlin, 2006:26), is considered by the government as a primary cause of diffuse poverty among the rural population (Government Mozambique, 2006). On the other hand, arable land is not a limiting factor in Mozambique. A study carried out by the national government suggests that of the 7 million ha available for agriculture, forestry and livestock production, at least 3.78 million ha are suitable for large-scale agriculture (including biofuels developments) (IIAM and DNTF, 2008:16).

Biofuels in Mozambique have recently emerged as a promising opportunity to promote agricultural development, improve energy security, boost exports and attract foreign investments meanwhile tackling poverty. Although biofuel production is still at an embryonic stage, a study commissioned by the government shows that 2.5 billion litres (around 62.5 PJ) of ethanol from sugar cane and sweet sorghum, and biodiesel from Jatropha and coconut could be produced annually under moderate agricultural technological inputs from an area of just 1.6 million ha (Econergy,

[3] A fourth criterion (cross compliance rules under the EU Common Agricultural Policy) applies only to EU production (Art.17.6) and thus falls outside the scope of this study.

[4] Alternatively, economic operators can prove compliance employing voluntary certification systems, or international agreements recognized by the EC (Art. 18.4).

[5] For a definition of *like* products and the debate surrounding PPMs see Matsushita et al. (2005: 236–245) and Read (2004).

2008). This production, which corresponds roughly to 9% of the projected EU consumption of biofuels in 2010,[6] could bring substantial benefits to Mozambique.

In this context, the government of Mozambique is very actively encouraging the introduction of biofuels. It adopted a National Policy Strategy in 2009 (Government Mozambique, 2009) which emphasises the importance of large-scale production of biofuels for exports as well as for domestic consumption as a means to advance rural development, poverty reduction, export revenues and energy security. The policy strategy highlights the creation of a National Programme for Biofuel Development to provide financial support to activities and projects; a National Commission for Biofuels to supervise the implementation of the policy strategy; and a Biofuels Commercialization Programme to promote the formation of a national market for biofuels. In addition, the government recognizes that the cultivation of energy crops for biofuels may trigger, or exacerbate, environmental and social problems. In response to that it has set up a Working Group on sustainability criteria and development models, within the Inter-ministerial Working Group on Biofuels, responsible for the development of a national strategy for sustainable biofuels that reflects the Mozambican reality (Schut et al., 2010a). A series of multi-stakeholders meetings have been organized by the Working Group with representatives from ministries, industry, civil society, farmer organizations, research institutions and development agencies with the purpose of developing a framework to facilitate and guide sustainable production of biofuels in the country. Version 'zero' of the sustainability framework, built around the principles of legality, social acceptability, energy security, economic viability, agricultural productivity and environmental protection, was presented in May 2010 and later opened for public consultation.

5. EU external governance and Mozambique

In this section the EU policy, its decision making process and the distribution of benefits and burdens in Mozambique are examined. Knowing that in the case of Mozambique the EU cannot rely on policy transposition and implementation as in member states, or on the incentives of EU membership as in the case of applicant countries, it is important to identify the type of instruments employed by the Directive to pursue application. In the text of the Directive, two types of instruments are presented: changes in the domestic opportunity structure via market access and trade incentives (Art. 17.1); and *ad hoc* international agreements with producing countries (Art. 18.4). Market access and trade incentives are used to change the domestic opportunity structure and promote voluntary application of the EU sustainability system by actors interested in participating in the EU market. The Directive, in addition, gives the EC the possibility to negotiate *ad hoc* agreements with producing countries that, once adopted, implemented and verified, may demonstrate compliance with the EU sustainability system. However, since *ad hoc* agreements are only optional and their conclusion is not favoured by the EC, market access and trade incentives are the main instrument employed by the EU Directive to pursue application in Mozambique.

5.1. Procedural analysis

In this subsection, the decision-making process of the EU sustainability system is evaluated in terms of actors' participation. The rationality behind this type of analysis is based on the observation from network governance studies that the extent and quality of communication between actors during the decision-making process deeply affect rules' expansion. The significance of an expansion of the EU organizational boundary, i.e., of an opening up of the EU decision-making process to foreign actors, is formally recognized by the EC. In a white paper on European governance (EC, 2001) the EC recommends that the EU "*improve[s] the dialog with governmental and non-governmental actors of third countries when developing policy proposals with an international dimension*". The procedural analysis that follows evaluates the existence of such organizational expansion focusing on the quality and extent of actors' communication during the EU decision-making process. The analysis is limited to two categories of Mozambican actors, the national government and the biofuels industry, since they play the dominant role in the application of the EU policy in the country.

Formally, the first opportunity for participation of Mozambican actors in the EU decision-making process was the public consultation exercise (A) (Fig. 1). The event was organized by the EC to know the views of public authorities, businesses, NGOs and other interested parties on questions related to a sustainability system for biofuels (EC, 2007b). However, the documents from this consultation reveal that no representatives of the Mozambican government, or the industry participated. The interviews suggest that this is the consequence, on the one side, of the government lacking human-financial resources and information about the EU policy initiative and, on the other side, of the industry being in its infancy. Needless to say the lack of an established industry in the country deeply affected participation dynamics. However, representatives of the sugar cane industry and early stage biofuels investors could have been identified already in 2007.

Communication between the EC and Mozambican actors was in practice limited to the direct consultation of the Mozambican government (B) (Fig. 1). The purpose of this consultation was to collect the opinion of selected governments (Brazil, South Africa, Mozambique, Malaysia and Indonesia) on a policy draft. Although this event could be viewed as a first move towards the involvement of foreign actors, interviews with EC officials reveal that participation of foreign actors, unusual in the renewable energy policy field, was motivated by WTO regulations. The WTO agreement on Technical Barriers to Trade requires governments that want to employ technical regulations and standards to develop and apply them in a transparent and non-discriminatory way.[7] The consultation exercise was executed with short notice and very late in the decision-making process, suggesting it had a formal rather than substantial meaning. The official policy proposal (EC, 2008b) was presented by the EC already in January 2008 shortly after comments from Mozambique were submitted. This event marks the end of the EC internal phase and the beginning of the institutional negotiation phase led by the European Parliament and the EU Council in which only informal participation through lobbying activities is possible. Although lobbying activities are common throughout the entire EU decision-making process and are highly informal by nature, the interviews confirm that Mozambican actors did not actively engage in lobbying activities, again, due to a lack of financial and human resources.

In sum, the EU sustainability system was formulated by the EC employing primarily a panel of experts (EC, 2008a), whereas communication with Mozambican actors was minimal and with

[6] This assumes that biofuels account for 5.3% of the energy use in transport.

[7] For a discussion in the context of climate protection measures see WTO and UNEP (2008).

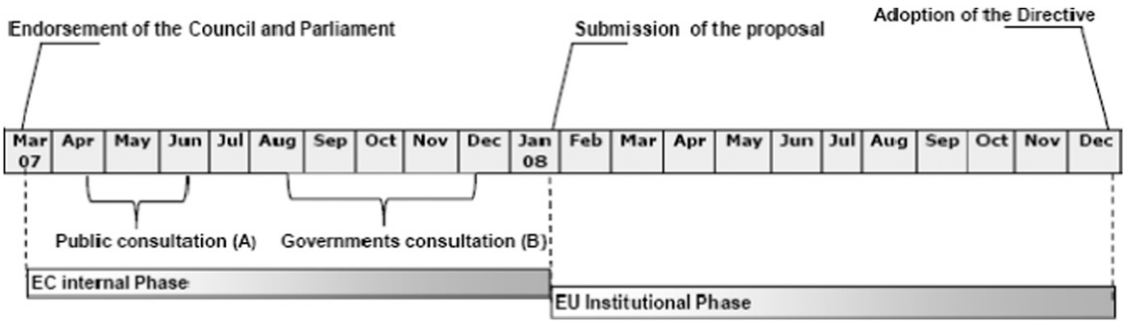

Fig. 1. Participation of Mozambican actors in the EU decision-making process of the sustainability system of Directive 2009/28/EC.

a formal rather than substantial value. Network governance approaches stress the importance of communication and actors' participation for expanding the scope of EU rules to third countries. In a similar way, actors' participation is a highly emphasised principle in the standardization field. International standard-setting procedures, e.g., ISO (1994) and ISEAL (2006), describe the formulation of sustainability standards as a process requiring extensive involvement of interested parties. However, in the case at hand the level and quality of communication between the EC and Mozambican actors during the decision-making process appear insufficient to promote the idea of a legitimate and appropriate policy in Mozambique.

5.2. Distributive analysis

This subsection explores the distributional side of the EU policy and, in particular, takes on the evaluation of the allocation of benefits and burdens amongst Mozambican actors. Market governance highlights the importance of market forces to induce change at domestic level where societal actors, such as firms and business associations, but also governments apply EU rules because ignoring them implies opportunity costs. In accordance with this literature, the way the EU policy affects the opportunity structure of actors in Mozambique portraits the likeliness of its application and, thus, its effectiveness. The distributive analysis in this section evaluates the effectiveness of the EU Directive by identifying and estimating, qualitatively, the burdens and benefits for two categories of actors, the industry and the government, departing from the assumption that benefits advance the application of the rules, while burdens hinder it.

5.2.1. Biofuels industry

The application of the EU policy creates substantial benefits for the industry through improved access to the EU market. The breadth of these benefits is dependent on the level of exports to the EU market. The objective here is not to quantify future exports of Mozambican biofuels, but to identify and evaluate the driving forces of such exports. The interviews highlight that the interest of the Mozambican industry in the EU market is influenced by its attractiveness, mostly in terms of prices and volumes, compared to alternative markets. Table 1 shows market prices and volumes for selected international markets. The EU is currently (2009) a large market and it is expected to be one of the major importers of ethanol and the major importer of biodiesel in 2020. It offers high premium prices for both ethanol and biodiesel in connection with the highest level of demand for imported biofuels in the short (2010–2015) and medium (2015–2020) term. An analysis by Schut et al. (2010b) of the biofuel projects formally submitted to the Mozambican government confirms that currently the EU market is largely perceived by investors as the premium market offering the best conditions for export. It should be noted, however, that other markets offer interesting opportunities for Mozambican producers. In the short-medium term, the South African market appears attractive for the development of a nascent export industry, despite smaller volumes, due to its geographical and cultural ties with Mozambique. Projects which see the participation of South African investors (Schut et al., 2010b) could be interested in supplying that market once the problems with the current South African policy strategy were resolved (USDA, 2009). For what concerns ethanol, the US and (possibly) China are potentially large markets attractive for Mozambican producers in the medium term.[8] In sum, it appears that the EU market is attractive for Mozambican producers of ethanol, although it is not the only option, while it is expected to be the most important market for biodiesel producers up to 2020.

However, it is important to draw attention to the volatility of market prices and international demand of biofuels. A primary driver of biofuels markets is public policy. Consumption mandates, tax exemptions and production subsidies can deeply affect consumer's demand of biofuels. In addition to policy support, the market price of biofuels is affected by the price of feedstock materials, which represents a substantial share of production costs, and the price of fossil fuels which are the alternative for consumers. As shown in Fig. 2, the EU market price of biodiesel has been highly unstable in the last 5 years with a strong correlation between the price of diesel and feedstock material. In a similar way, the price of ethanol on the US market has been fluctuating with a certain level of correlation to the price of gasoline and feedstock material (Fig. 3). Finally, also the development of new production technologies, i.e., 2nd and 3rd generation biofuels can affect market prices and international trade of ethanol and biodiesel (IEA, 2009).

Conversely, the application of the EU policy imposes only limited burdens on the Mozambican industry. Burdens are represented by the costs of meeting the sustainability criteria (Art. 17), and the costs of verification and monitoring activities (Art. 18). The costs of meeting the EU sustainability criteria are expected to be minimal due to favourable climatic conditions and the availability of land in Mozambique. On the one hand, biofuels produced using local raw materials (e.g., sugar cane, sweet sorghum, jatropha and coconut) should ensure positive GHG balances, certainly above the 35–50% emissions reduction required by the Directive (see, e.g., MNP, 2008). On the other hand, the fulfilment of land use criteria should be relatively straightforward due to the availability of large extensions of fallow and unused arable land in the country (IIAM and DNTF, 2008, Econergy, 2008), although the lack of fully agreed characterizations of land types leaves a level of uncertainty. Likewise, the costs of verification and monitoring activities of Art. 18 are not

[8] The Chinese and the Indian markets have identified sub-Saharan Africa as a region with high biofuels potential to become a large scale biofuels supplier in the next decade (Oxford Analytica 2009).

Table 1
Ethanol and biodiesel prices (2010) and imports (2009), and projected imports (2015 and 2020) on selected international markets.

Market	Market prices 2010 (€/t)	Imports 2009 (PJ/y)	Projected imports (PJ/y)	
			2015	2020
EU				
Ethanol	564	23	41	52
Biodiesel	700	70	162	208
US				
Ethanol	408	25.3	120	216
Biodiesel	740	Negligible	Negligible	Negligible
Japan				
Ethanol	587	11.4	17	25
Biodiesel	n/a	Negligible	Negligible	Negligible
South Africa				
Ethanol	586	Negligible	6.3	6.9
Biodiesel	537	Negligible	7.4	8.2
China				
Ethanol	711	Negligible	113	216
Biodiesel	n/a	Negligible	Negligible	Negligible

Notes on import: Values for the year 2009 are from F.O. Lichts (2010a) and EurObserv'ER (2010). Projected imports for 2020 are estimated as follow. EU values are based on the achievement of the 10% consumption target, and assume 20% of the target is met by imports. US imports are estimates of the EPA (2009). The Japanese market is estimated using a 3% ethanol target for 2010 and 10% in 2020. South Africa values are based on the targets of the Biofuels Industrial Strategy (DME, 2007), assuming that the targets are maintained throughout the year 2020 and domestic production is unable to meet demand. Chinese values are based on NDRC (2007), assuming that domestic production reaches 1.6 Mt of ethanol and 0.3 Mt of biodiesel in 2010 and grows very modestly thereafter.
Notes on market prices: EU: ethanol T2, FOB ARA (F.O. Lichts, 2010b); biodiesel RME, FOB ARA (F.O. Lichts, 2010c). US: ethanol, New York (F.O. Lichts, 2010b); biodiesel SME, East Coast (F.O. Lichts, 2010c). Japan: ethanol price represented by the CIF price of Brazilian ethanol (F.O. Lichts, 2010b). South Africa: ethanol and biodiesel reference prices. China: anhydrous ethanol, Jilin (F.O. Lichts, 2010a). Exchange rates (April 2010) 1€=1.35 USD; 10 South Africa Rand; 9 China CNY.

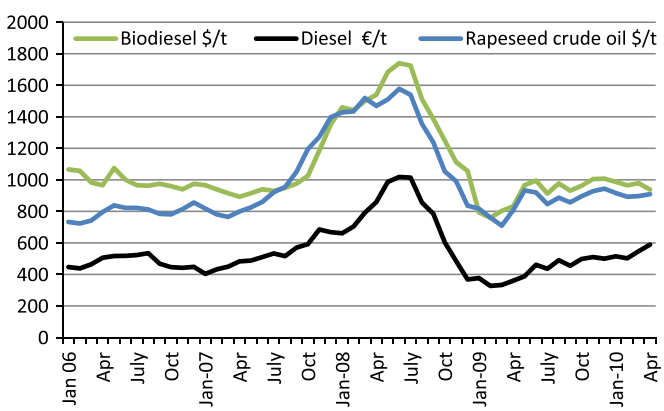

Fig. 2. Market prices of biodiesel, diesel and crude rapeseed oil in the EU (2006–2010).
Sources: Biodiesel, RME FOB ARA (World Biodiesel Report F.O. Lichts); Diesel, FOB ARA (US Energy Information Administration); Rapeseed crude oil, ex-mill ARA (FAO International Commodity Prices)

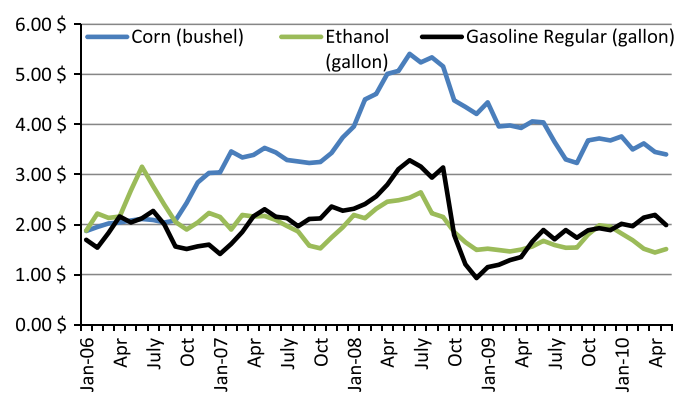

Fig. 3. Market prices of ethanol, regular gasoline and corn in the US (2006–2010).
Sources: Corn (National Agricultural Statistics Service); ethanol (USDA Iowa Ethanol Plant Report); Gasoline Spot Price FOB Gulf Coast (US Energy Information Administration).

expected to be a constraint for the industry, although the definition of precise monitoring and verification rules is still under development at member states level. A rule of thumb is that these costs should not exceed the cost of shipping the biofuel from Mozambique to Europe, or 0.05 €/l (Truyens, 2009). However, this estimate assumes that the government will support compliance within the industry by setting up verification infrastructures, local certification bodies and land regulation.

5.2.2. National government

The application of the EU sustainability system in Mozambique generates benefits also for the national government. A first type of benefits is directly connected to access to the EU market and is conditional to the EU offering higher prices and demanding larger volumes of Mozambican biofuels than alternative markets. In this way, additional production to supply the EU market generates tax revenues for the government, but also benefits for the economy at large, e.g., income creation, employment, infrastructures, etc. Higher market prices, conversely, will expand the industry's tax base with corresponding tax benefits for the government. In this context, and with reference to the market prices and volumes described in Table 1, the benefits for the government and the economy at large appear substantial in the case of biodiesel, since the sector will be largely dependent on EU demand, and less important in the case of ethanol due to the existence of alternative markets. Second, the application of the EU sustainability system yields benefits independent from exports, i.e., externalities. However, the application of the EU system, with its (narrow) focus on climate and biodiversity promotes positive environmental externalities that are of lower priority in Mozambique. Interviews with government's officials stress how biodiversity and climate, pivotal issues in the EU, are not a major

concern for the government whereas the impact of large-scale production of biofuels on competition for land and on food production is a chief cause of worry. A last type of externalities is of political nature. The national government might be interested in demonstrating 'goodwill' to international donors and powerful trade partners in consideration of the large share of donations contributing every year to the national budget (Econergy, 2008). Still, 'goodwill' can imply varying degrees of action.

The application of the EU Directive in Mozambique imposes a range of burdens to the national government in connection with the public investments required to support industry's compliance. These might include the cost of legislation development (land zoning and mapping), training of personnel, creation of an institutional framework and establishment of local certification bodies and laboratories. In so far, the government with the support of international donors and development agencies has invested significantly in the definition of a national framework for sustainable biofuels. The Working Group on sustainability criteria and development models has brought together public and private actors with a stake in the issue to develop a national sustainability framework. However, whether the government will also cover the full cost of a complex certification system such as the one required by the EU is not decided yet.

In sum, the EU policy affects the opportunity structure of actors in Mozambique. Access to the EU market creates substantial benefits for the biofuels industry and might entail larger production volumes in Mozambique, especially in the case of biodiesel, which in turn can generate benefits also for the government and the economy. In order to reap these benefits the government has to undertake a number of investments to support industry's compliance. However, the lack of significant positive externalities for the government means that the application of the EU policy in Mozambique will be tied to the benefits of exporting the fuels to the EU. This deeply influences the prospects of the long-term application of the policy by the industry. Market governance stresses the capacity of market access to encourage domestic change. However, studies have shown that external rules that restrict actors' economic activity or that have a negative impact of their economic competitiveness, might be contested and rejected. In the case at hand, the distributive analysis shows that rapid changes of market features, prices and demand for Mozambican biofuels, cannot be excluded. Such changes might alter the competitiveness of firms applying the EU sustainability system and, thus, advocate for a rejection of the system. In this way market access might not be sufficient to sustain the long term application of the EU policy in Mozambique.

6. Discussion

The analysis of the EU Directive, its decision-making process and the distributive effects in Mozambique, has shown that the interest of the Mozambican industry in participating in the EU market promotes the application of the EU system, whereas the lack of participation in the decision making process does not advance the idea of a legitimate and appropriate policy in Mozambique. The purpose of this section is to discuss the findings interpreting the EU mode of external governance and its potential effectiveness in Mozambique. In conclusion of the section a way forward for policy makers is suggested.

The findings have shown that the expansion of EU rules in Mozambique follows a market mode of governance. Research on external governance and Europeanization distinguishes market modes of governance from hierarchical and network modes. In the case at hand, the lack of clear and enforceable rules as well as the lack of communication between EU policy-makers and Mozambican actors suggests that hierarchical and network modes of governance are not at work. The selection of market governance is not necessarily straightforward and might be motivated by, for instance, the constraints limiting the use of other modes, or an European inward-looking view on the problems and solutions of biofuels production. The predominance of market governance could even be interpreted as part of a green-washing strategy to justify increasing policy support for biofuels in the EU, or worse as a protectionist measure in favour of the EU biofuels industry. Notwithstanding the motivations behind its selection, market governance will shape the effectiveness of the EU policy in Mozambique. In the literature, the effectiveness of EU external governance is treated as a dependent variable influenced by numerous factors e.g., the EU bargaining power (Barbé et al., 2009; Youngs, 2009), the domestic structure of 3rd countries (Youngs, 2009; Lavanex and Schimmelfennig, 2009), but also by the perceived legitimacy of the EU policy (Barbé et al., 2009). The findings of this study suggest that the use of market governance will produce only an *unstable* application of the EU policy in Mozambique. As seen above, the voluntary application of the EU policy by the industry is dependent on the opportunity structure. The opportunity of exporting to the EU is based on a constant recalculation of the expected payoffs by the industry. Profit seeking actors stand ready to abandon the system immediately should some alternatives promise greater utility. Knowing that market prices of biofuels and their feedstock have been highly volatile, as illustrated by Figs. 2 and 3, and that market demand is largely relying on governments' support, it is necessary to ask what will happen to the attractiveness of the EU market, illustrated in Table 1, in case these elements suddenly changed. In this context, the effectiveness of EU governance, i.e., the application of EU rules in Mozambique, is considered to be *unstable* and potentially subject to rapid changes.

In addition, the EU sustainability system will produce only *thin* impacts. As described in Section 3, the EU system covers only a small set of sustainability issues. Such narrow focus is motivated by WTO rules, which oppose the introduction of PPMs standards based on social and local environmental criteria, and by the incapacity of certification systems focusing on individual consignments to account for macro-economic impacts. In this context, if EU policy makers are serious about sustainable biofuels, a series of changes to the EU policy approach is required to advance more *stable* and *substantial* policy results.

6.1. A way forward

On the one hand, the effectiveness of the current EU policy approach could be improved by promoting a proper functioning of the market mode of governance. It has been argued in the EU policy debate that high levels of imports from developing countries should be avoided for the potential extreme, negative impacts that large-scale production could cause in these countries. However, it must be recognized that the existence of EU demand for biofuels produced outside the Union is a necessary element of market governance since Mozambican producers have no incentives to apply EU rules when exporting to non-EU markets, or consuming domestically. Hence, by granting a share of the EU market to more efficient producers from countries such as Mozambique, EU policy-makers might in fact improve the effectiveness of the EU policy. Still, policy impacts in Mozambique will be *thin*, at best, with some of the most pressing domestic concerns, such as food security and land-use changes, left out.

In order to promote simultaneously *stable* and *substantial* impacts in Mozambique, the market governance approach based on market access should be integrated with a network mode of

governance based on policy legitimacy. Political theory suggests that policy legitimacy is affected by the content, the decision-making process and the source by which the rule is constituted (Hurd, 1999). Based on that, the legitimacy of the EU system could be improved by opening up the decision-making process to Mozambican actors and by re-distributing benefits and burdens. A more legitimate decision-making process marked by substantial participation of Mozambican actors could be advanced by establishing EU–Mozambique communicative networks characterized by informal interactions between public and private actors with distinctive, but interdependent interests. The EU has already established a number of communication platforms involving actors from third countries such as the energy dialog with Russia in the energy sector.

Furthermore, policy legitimacy could be improved by re-allocating benefits and burdens applying a mix of information and economic instruments following actors' interests and priorities. In this way, areas where interests and priorities are consistent, e.g., food security and land competition, would become pivotal for cooperation and to advance the idea of a policy appropriate and in everyone's interest. The EU could provide technical assistance for the development of a national system, i.e., land zoning, land-use regulation, monitoring, etc. This would ensure the full engagement of the Mozambican government since these are critical issues for the country, and not only for biofuels. In areas characterized by mismatching interests, e.g., climate and biodiversity issues, prioritized in the EU, but not in Mozambique, technical and financial assistance would reduce policy burdens promoting technical development in Mozambique. Nonetheless, areas that do not require cooperation, e.g., labor and local environmental issues should be left to the responsibility of the party with authority since these are better handled domestically through public policies not limited to biofuels. In this way, the EU policy for sustainable biofuels would come close to a development policy rather than a certification scheme, seeking a balance between the market need for standardization and the respect for local interpretations of the sustainability concept.

7. Conclusions

This study analysed the recent EU policy for sustainable production of biofuels (2009/28/EC), its decision-making process and the expected distributive effects, in order to evaluate to what extent the policy can ensure sustainable production of biofuels outside the EU. The case study showed that the EU seeks to impose its rules and values on sustainable biofuels using its market leverage through trade. The Europeanization of biofuels production in Mozambique follows a market mode of external governance in which Mozambican companies apply the EU policy in order to access the EU market. However, the application of the EU policy by the Mozambican industry will be *unstable*, due to the propensity of profit seeking actors to abandon the system should a change of market features (prices and demand) make some alternatives more profitable; and results will be *thin* due to the narrow focus on climate and biodiversity issues.

A number of tropical developing countries are interested in large-scale production of biofuels. However, formally only five countries were directly involved in the EC consultation process. Among them Brazil, Malaysia and Indonesia have well established biofuel industries with the resources to make themselves heard in Brussels, e.g., through lobbying activities. The rest of the developing world where, like in Mozambique, the biofuel industry is still in its infancy does not have such opportunity. Yet, it is especially in these countries that a policy for sustainable biofuels can have substantial positive impacts. The EU Directive comes timely at a point when sustainable development could be triggered through biofuels. This window of opportunity should not be missed since these countries might still want to produce biofuels, if not for the EU, then for other markets and for domestic consumption. In this context, how policies are designed, who participates and how burdens and benefits are shared amongst parties are crucial elements that deserve the attention of EU policy makers.

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