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THE ROLE OF NATIONAL LEGISLATION IN BIOENERGY GOVERNANCE

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Bioenergy supply chains pass several layers of governance, including both emerging governance mechanisms that specifically address bioenergy and existing regulations, such as environmental codes affecting forestry and agriculture. The sustainability requirements associated with the EU Renewable Energy Directive (EU-RED) is an example of how norms and sustainability priorities in one region can be expressed so as to influence activities in other regions, when actors in these other regions aim to produce for the EU market. Achieving aspirations for developing sustainable bioenergy production systems and supply and value chains requires coordination among actors and parties to ensure that all necessary governance mechanisms are in place and capable of fulfilling the appropriate standards setting, control, governance and assurance roles that are required, collectively. In this paper, the capacity of public governance to promote bioenergy production for the EU-RED market was assessed for thirteen countries in Africa, Asia, and Latin America. Environmental legislation was assessed on how it covers the sustainability requirements included in EU-RED, as well as general sustainability aspects. The countries' capacities to enforce legislation were assessed by combining globally applicable indexes. While some aspects (e.g., nature protection) were found to be mostly covered well in legislation, other (e.g., wetland protection, GHG emissions) where covered less well. Results indicate that enforcement of legislation can be a challenge in many countries.

Keywords: bioenergy policy, legal aspects, environmental aspects biomass production, socio-economic aspects, non-technical barriers to bioenergy

1 INTRODUCTION

Governance is the sum of the many ways actors and institutions, public and private, manage common affairs. It is a continuing process through which diverging interests may be accommodated and cooperative action may be taken [1, 2]. We refer to sustainability governance as governance concerned with promoting positive effects of production or development processes and avoiding/mitigating their negative impacts, considering all three dimensions of sustainability [3].

In a global economy, a product often originates from another country than where it is purchased. Thus, consumers who try to make environmentally conscious purchasing decisions, and regulatory agencies and governments that are involved in enforcing sustainability standards, need to be concerned with multinational value chains, which to a significant extent are controlled by large private companies rather than nations [4].

In global economies, the scale and complex structure of production and processes challenge the capacity of nation-state institutions to govern activities beyond their borders and jurisdiction [4]. This, along with an increased popularity of neoliberal programs of deregulation and privatization, created space for alternative forms of private governance [5, 6]. It has been claimed that such private governance is far from filling the public governance deficit created by the global economy [4] and the case of biofuels has been proposed as being an example of "misgovernance" [2].

Bioenergy supply chains pass several layers of governance, including both emerging governance mechanisms that specifically address bioenergy (e.g., bioenergy sustainability standards and certification systems) and existing regulation of sectors involved, such as work environment regulations, environmental codes, best-management agriculture/forestry practices, and international trade standards [2, 3, 7].

The EU Renewable Energy Directive (EU-RED) includes a specific set of sustainability requirements on biofuels that companies producing for the EU-RED market need to comply with. Compliance can be verified through an approved voluntary certification scheme. This example of *co-regulation* was widely supported in a recent global bioenergy survey [8]. However, implementation within EU-RED can be challenging. The scope of private governance is limited [4] (e.g., only 10% of the world's forests are certified [9]) and public governance in prospective bioenergy producer countries may be based on norms and sustainability priorities that do not coincide with those expressed in the EU-RED. Furthermore, besides that legislation may not suffice to safeguard sustainability as expressed in EU-RED, the capacity to enforce legislation may be insufficient.

Several studies have argued that the nation-state's role remains essential in sustainability governance of global economies, for example in facilitating interactions and harmonizing sustainability objectives across global, national and subnational levels [4-6]. However, there are few studies on the role of public governance in the context of transnational bioenergy supply chains.

Especially, there is little information about relevance and effectiveness of public governance in developing countries that have little experience in bioenergy production and trade [3].

This paper presents results from an assessment of nation-state legislation and enforcement in thirteen countries in Africa, Asia, and Latin America, which was done to inform about the capacity of public governance to promote bioenergy production for the EU-RED market.

First, environmental laws in the thirteen countries (in total, 1677 legislative texts) were individually assessed on how they cover sustainability aspects in general and the sustainability requirements included in the EU-RED in particular.

Second, the countries' capacity to enforce legislation was assessed based on combining three globally applicable indexes, which in different ways give an indication of enforcement capacity in the countries. Since the three indexes were available for a large number of countries, a global overview was produced in addition to the assessment for the thirteen focus countries.

The results presented here are used in further work and should be considered preliminary.

2 METHODOLOGY

2.1 Comprehensiveness of national legislation

The thirteen countries that were selected for the assessment were: Tanzania, Malawi, Mozambique, Uganda, Ethiopia, Nigeria (Africa); Indonesia, Malaysia, Pakistan, India (Asia); Brazil, Argentina, Guatemala (Latin America).

Each country's environmental legislation was extracted from the ECOLEX database. ECOLEX is an information service on environmental law, managed by FAO, IUCN and UNEP with the purpose to build capacity worldwide by providing the most comprehensive possible global source of information on environmental law [10].

All legislative texts were then systematically reviewed. Basic information was noted for all documents, and documents deemed relevant for bioenergy were further analyzed. First, their *connection* to bioenergy was noted. Connections include:

- Feedstock production
  - Biofuel feedstock production
  - Agriculture
  - Forestry
  - Nature and biodiversity protection
  - Other land-use or land use change
- Processing
  - Biofuel processing
  - Industrial activities
- Other
  - Other relevance (used in case of connections other than the above)

The legislative texts were then assessed on their *coverage* of sustainability concerns, focusing in particular on the sustainability requirements in the EU-RED, but considering also sustainability aspects in general (criterion 17:2 on GHG emissions savings was excluded from the analysis. It was instead covered by the general concern regarding GHG emissions):

- EU RED Requirements
  - Clearing of forests - (Article 17:3a; 17:4bc)
  - Impacts on areas designated on nature protection purposes - (Article 17:3bi)
  - Impacts on rare, threatened and endangered species - (Article 17:3bii)
  - Conversion of grasslands - (Article 17:3c)
  - Drainage of peatlands - (Article 17:5)
  - Conversion of wetlands - (Article 17:4a)
- General sustainability aspects
  - Social sustainability
  - Biodiversity
  - GHG emissions
  - Carbon stock
  - Air, water and soil
  - Ecosystem services
  - Land-use

In all cases, if a law includes restrictions relevant for one or several of the above EU-RED requirements or general sustainability aspects, it was noted.

Furthermore, all laws were classified as either national or sub-national, depending on their jurisdictional validity. Sub-national legislation means that it is provincial or local, or that it is only relevant for a specific geographical area (e.g. establishment of a defined protected area). National legislation means that it is nation-wide.

If stated in-text, the institution responsible for enforcement was noted. This was done in order to identify how bioenergy related legislations are enforced in juridical sense.

In addition, each legislative document was downloaded as a pdf file in order to develop a database on bioenergy related legislation.

The assessed countries were then grouped (Africa, Asia, Latin America) in order to identify similarities and differences, both between countries within the same region and between regions. Finally, global patterns were analyzed. See [11] for full methodology.

2.2 Enforcement capacity

As noted above, if institutions responsible for enforcement were identified in the legislative texts, this was noted. Besides information about institutions responsible for enforcing bioenergy related legislation in each country, this allows for an illustration of whether or not the different countries tend to specify institutions responsible for enforcement in-text in their bioenergy related legislation.

On a country level, it is not feasible to assess how each and every law is enforced in practice. Instead, the enforcement capacity for each country was assessed based on combining three globally applicable indexes judged to be relevant:

- The *Corruption Perception Index* (CPI) that measures the perceived levels of public sector corruption [12];
- The *Global Integrity Index* (GII) that assesses the existence, effectiveness, and citizen access to key anti-corruption mechanisms at the national level in countries. It is intended as an entry point for understanding the anti-

corruption and good governance mechanisms in place in a country that should ideally help to prevent, deter, or punish corruption [13]; and

- The *Index of Democracy* (ID) that measures the state of democracy based on 60 indicators grouped in five different categories: electoral process and pluralism, civil liberties, functioning of government, political participation, and political culture [14].

The three indexes were normalized and combined with equal weight so as to obtain an index named Enforcement Index (EI), with a range from zero to ten. The countries were categorized as having "High", "Medium", or "Low" enforcement capacity depending on the numerical result. The EI was used to indicate the enforcement capacity in the countries. See [11] for full methodology.

The Rule of Law Index (RLI) [15] was used for additional evaluation of the enforcement capacity for the countries covered by the RLI..

3 RESULTS

3.1 Coverage of national legislation in relation to sustainability aspects of bioenergy

Of the 1677 legislative documents that were reviewed, 804 were found to be relevant for bioenergy (Fig. 1). Most of the relevant laws addressed aspects of relevance for feedstock production in general, and agriculture in particular. Only 13 laws were found that directly addressed the production of bioenergy feedstock, and only 12 addressed biofuel processing directly (Fig. 2).

Most laws are thus relevant for all types of biomass production and industrial processing. In addition, 259 laws were found relevant despite that they did not directly address feedstock production or processing. Most commonly these laws relate to land rights, but also to, e.g., environmental education and promotion of renewable energy.

In summary, looking at the EU-RED requirements the assessed countries' legal coverage seems to be better concerning *Impacts on areas designated for nature protection purposes* and *Clearing of forests*, than concerning *Conversion of grasslands*, *Drainage of peatlands* and *Conversion of wetlands* (Table 1).

Looking at the more general sustainability aspects, the assessed countries' legal coverage seems to be better concerning *Social sustainability*, *Land-use* and *Water*, than concerning *GHG emissions*, *Air* and *Carbon stock* (Table 2).

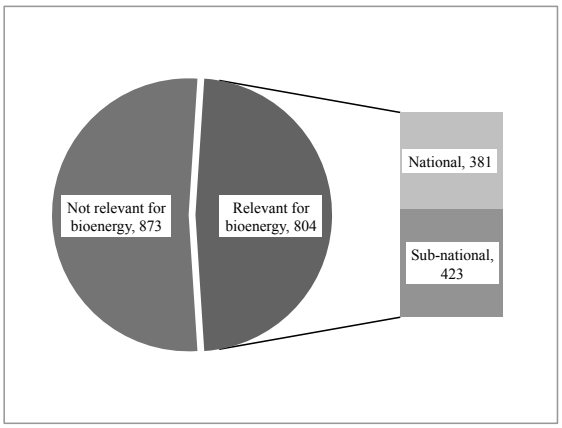

Figure 1: Basic information about the assessed legislative documents. Number of texts relevant for bioenergy, and their jurisdictional validity.

Table 1: Coverage of RED requirements in bioenergy related legislation: global overview. "+++" indicates high coverage, "0" indicates varying coverage, and "---" indicates low coverage.

	Asia	America	Africa
Impacts on protected areas	+	+++	++
Clearing of forests	+	+++	0
Impacts on threatened species	---	0	0
Conversion of wetlands	---	---	---
Conversion of grasslands	---	---	---
Drainage of peatlands	---	---	---

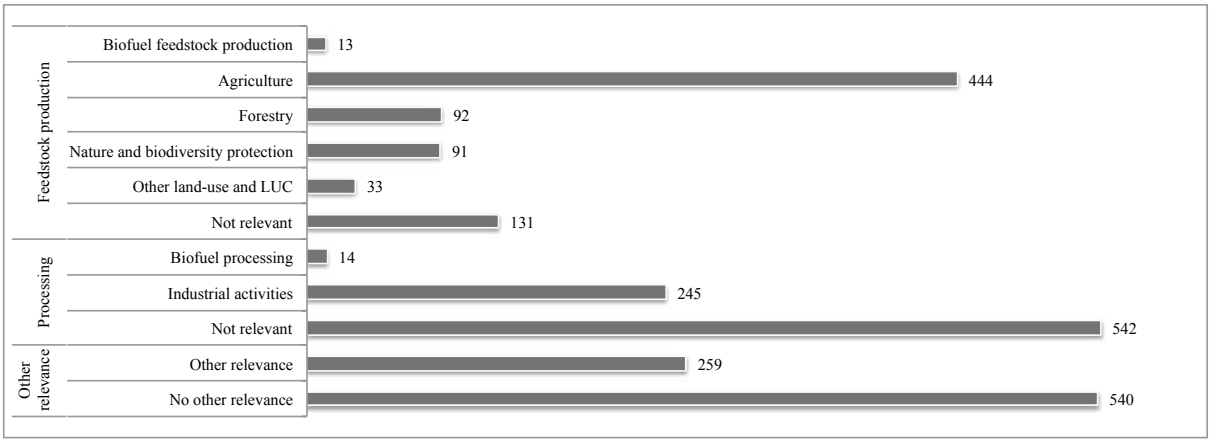

Figure 2: Connections between bioenergy and the assessed legislative documents

Table 2: Coverage of general sustainability aspects in bioenergy related legislation. Codes described in Table 1.

	Asia	**America**	**Africa**
Social sustainability	+++	+++	+++
Land use	++	+++	+
Water	+	+++	++
Biodiversity	0	++	0
Soil	0	+	0
Ecosystem services	-	0	-
Carbon stock	-	-	-
Air	---	-	---
GHG emissions	---	---	---

Table 3: Overview of results from the assessment of enforcement capacity in the thirteen countries. The categories given in the table are those used by the indexes

	Perceived level of public sector corruption	Anti-corruption framework	State of democracy	**Enforcement capacity**
Indonesia	High	Moderate	Flawed democracy	**Medium**
Malaysia	Medium	Moderate	Flawed democracy	**Medium**
Pakistan	High	Moderate	Hybrid regime	**Low**
India	Medium	Moderate	Flawed democracy	**Medium**
Brazil	Medium	Moderate	Flawed democracy	**Medium**
Argentina	High	Weak	Flawed democracy	**Medium**
Guatemala	Medium	Weak	Flawed democracy	**Low**
Tanzania	High	Weak	Hybrid regime	**Low**
Malawi	Medium	Moderate	Hybrid regime	**Medium**
Mozambique	High	Very weak	Hybrid regime	**Low**
Uganda	High	Weak	Hybrid regime	**Low**
Ethiopia	High	Very weak	Authoritarian regime	**Low**
Nigeria	High	Weak	Authoritarian regime	**Low**

3.2 Enforcement capacity

As previously discussed, legislation must be properly enforced to be effective. Otherwise, laws may be comprehensive and stringent, but effectless.

The enforcement capacity was designated "Low" in seven countries and "Medium" in six countries. No country was categorized as having "High" enforcement capacity (Table 3, Fig. 3).

Applying the EI Index on a global level (Fig. 3) shows that only a few countries in Europe, North America, and Oceania are classified as having a "High" enforcement capacity.

5. DISCUSSION

Whether nation-state legislation and enforcement suffice to promote sustainable bioenergy supply chains cannot be concluded based on the assessment results presented here. It can however be concluded that the assessed countries' legislation in general poorly cover three of the EU-RED requirements, and also poorly cover three of the more general sustainability aspects. It can further be concluded that enforcement of legislation seems to be a challenge in many countries .

Policymakers that establish incentives or targets to promote bioenergy are understandably concerned that risks are properly considered when bioenergy projects are being contemplated or incentives designed. The recent years' experience show that public concerns can influence politicians, and induce considerable dynamics in the policy field.

The absence of good governance can represent a considerable business risk to actors operating in the European bioenergy sector. Sustainability schemes can help reduce risks by increasing the trust and legitimacy in companies and bioenergy supply chains. Given that bioenergy systems can have both positive and negative effects - meaning that bioenergy deployment needs to balance a range of environmental, social, and economic objectives that are not always mutually compatible - the conclusions presented above motivate further research to provide better insights into complementary functions of private and public governance in different countries.

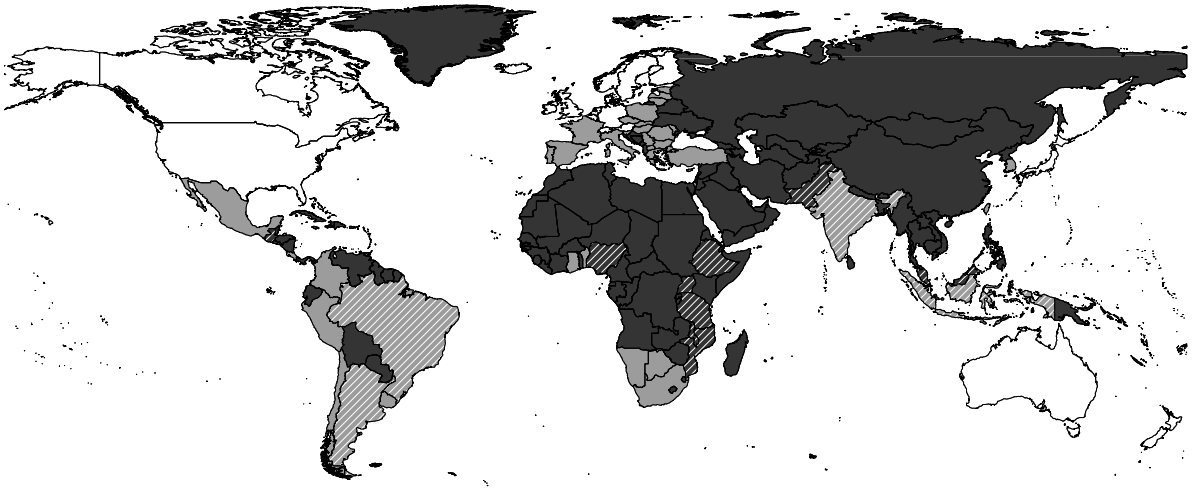

Figure 3: Enforcement capacity, global overview. White: high capacity to enforce legislation; light grey: medium; dark grey: low. Countries assessed in sections 3.1 and 3.2 are marked with diagonal white stripes..

5.1 Limitations and uncertainties

The ECOLEX database (FAO et al. 2011) is stated to "provide the most comprehensive possible global source of information on environmental law". The database may however not be perfectly comprehensive. Therefore, it is possible that not all laws relevant for bioenergy have been analyzed for all the assessed countries.

Only texts classified as "legislation" in the database were included in the main assessment. Texts classified as "regulation" were excluded. Due to the different cultures and traditions that exist regarding the legislative framework in different countries, it was assumed that some countries restrict certain activities primarily in legislation and others primarily in regulation. Therefore, in an attempt to avoid erroneous conclusions about certain countries' legislative coverage in relation to the RED sustainability criteria, a complementary analysis of regulations was made in cases where no laws were found related to a certain EU RED requirement. See [11] for details.

It should be emphasized that the sole existence of laws related to, for example, criterion 17:3a on clearing on natural forests, does not automatically mean that clearing of natural forests is restricted per se. It might mean that it is prohibited without permission or in specific areas. However, it is assumed that the more laws that restrict activities in similar ways as a specific requirement or concern, the higher the possibility that bioenergy is produced in a way that complies with it.

As noted, the methodology for estimating the enforcement capacity will be revisited in the further work.

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