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Research paper

## Food security criteria for voluntary biomass sustainability standards and certifications

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### ABSTRACT

With the shift from petroleum-based to biomass-based economies, global biomass demand and trade is growing. This trend could become a threat to food security. Though rising concerns about sustainability aspects have led to the development of voluntary certification standards to ensure that biomass is sustainably produced, food security aspects are hardly addressed as practical criteria and indicators lack. The research objective is to identify how the Human Right to adequate Food (RtaF), which is applicable in over 100 countries, can be ensured in local biomass production and in certification systems in food insecure regions. We aim to first develop a suitable conceptual framework to integrate the RtaF in biomass production, processing and trade and derive guidance for the choice the criteria. Second, we identify appropriate criteria to ensure that the RtaF is not violated by certified biomass operators based on a comprehensive literature review, stakeholder workshops and expert interviews with certification bodies, standard initiatives, NGOs, ministries, scientists and enterprises. The conceptual framework is based on the UN “Voluntary Guidelines to Support the Progressive Realization of the RtaF in the Context of National Food Security” and the four dimensions of food security. Based on this framework, we developed the rights-based food security principle. We selected 45 criteria that ensure that the RtaF is not adversely affected by certified biomass production of companies and farmers. The suggested criteria are applicable to all biomass types and uses and serve as a best-practice set to complement existing sustainability standards for biomass.

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### 1. Introduction

International demand and trade for agricultural commodities is growing while governments have started to shift from petroleum-based to bio-based economies. Hence, the rising demand for biomass is leading to a rising competition between the different biomass uses in the context of limited availability of arable land,

water and energy [1]. This trend can have adverse impacts on food security at two levels: At the international level through rising food prices and lower supply of food, and at the local level through the direct competition between biomass production for non-food purposes and available land and water resources for food production [1–4]. In the past years, the increasing use of bioenergy in the industrialized countries has led to more biomass imports and large-scale land acquisitions, which are associated with many, often negative, effects on the local population of the exporting countries [5–7]. These new markets for biomass attract national and international investors. Although international organizations such as World Bank and UNCTAD [8] promote foreign direct investment in agriculture in the expectation of positive effects on the development of the agricultural sector, most of these investments fail to include environmental and social aspects in a responsible way [9].

Sustainability concerns and climate change led to the development of voluntary certification schemes in the past decades [10,11]. As an answer to sustainability requirements for biomass, various initiatives for sustainability standards and certification schemes

*Abbreviations:* FPIC, Free, Prior and Informed Consent; FSC, Forest Stewardship Council; ISCC, International Sustainability & Carbon Certification Standard; RAI, Principles for Responsible Investment in Agriculture and Food Systems of the Committee on World Food Security; RSB, Roundtable on Sustainable Biomaterials; RSPO, Roundtable for Sustainable Palm Oil; RtaF, Human Right to adequate Food; RTRS, Round Table on Responsible Soy; VGGT, Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security.

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have emerged as new private governance mechanisms [11–14]. It is assumed that adverse environmental and social impacts of large-scale biomass production, export and trade can be solved through private engagement and cooperative mechanisms involving civil society actors, business and state authorities [13,15,16]. In the last two decades, voluntary sustainability standards proliferated [17] yet with great differences in the scope of sustainability and feedstock types. The main standards were mostly developed in multi-stakeholder processes referring to one specific feedstock such as the Forest Stewardship Council (FSC) for wood, the Round Table on Responsible Soy (RTRS), and the Roundtable for Sustainable Palm Oil (RSPO). Others refer to multiple feedstock such as the Roundtable on Sustainable Biomaterials (RSB) or the International Sustainability & Carbon Certification Standard (ISCC). These initiatives gained support with the introduction of the Renewable Energy Directive of the European Union, which includes a set of mandatory sustainability criteria for bioenergy [18]. Voluntary certification systems which fulfil these criteria can be used to prove compliance with the directive.

In addition, different guidelines emerged at the international level targeting the responsibility of investors in the agricultural sector such as the 'Principles for Responsible Investment in Agriculture and Food Systems' (RAI) defined by the Committee on World Food Security in 2014 and the 'Principles for Responsible Agricultural Investment that Respects Rights, Livelihoods and Resources' [8] developed by the World Bank, the Food and Agriculture Organization (FAO), the International Fund for Agricultural Development, and the United Nations Conference on Trade and Development (2011). Two guidelines of special importance to food security were released by the FAO: (i) the 'Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security' (hereafter Right to Food guidelines) providing recommendations, mainly for governments, for the implementation of the Human Right to Adequate Food in 2004 [20], and (ii) the 'Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security' (VGGT) in 2012 [21]. The VGGT build upon the Right to Food guidelines and complement these with technical instructions specifically on land rights. The FAO also developed the 'Bioenergy and Food Security' approach to assist countries in their design and implementation of sustainable bioenergy policies and strategies that support also food security and rural development. A broader focus on human rights in business practices led to the development of the UN Guiding Principles on Business and Human Rights, which were endorsed by the UN Human Rights Council in 2011 [19].

Both, the private sustainability standards and the international guidelines, intend to guide and voluntarily regulate sustainability aspects of biomass production. Certification systems monitor the sustainability practices of individuals through a third-party verification of the implemented criteria of a voluntary or obligatory standard. This requires exactly defined and measurable criteria that can be controlled during on-site audits [22,23]. The primacy of food and nutrition security within the production of biomass is widely discussed at the international level and stipulated along the civil society landscape [24]. Yet only few proposals have been made for assessing food security aspects in voluntary, private certification standards for biomass [25]. Among the various biomass sustainability standards and certification schemes, only the RSB defined a comprehensive guideline to assess food security [26]. However, their assessment method is complex and seems hardly applicable in the context of voluntary certifications due to the required extensive data collection and analysis. A study assessing the sustainability performance of different biomass certification schemes revealed a lack of methodologies to assess and avoid negative

impacts on local food security through certification standards [27].

The objective of this research is to identify how food security and the Human Right to adequate Food, which is applicable in over 100 countries, can be ensured in local biomass production in food insecure regions through certification systems. Two research questions are therefore addressed:

1. What is a suitable conceptual framework to integrate the Right to adequate Food in biomass production, processing and trade and which can guide the choice of criteria and indicators?
2. Which criteria are appropriate to ensure that the Right to adequate Food is protected by certified biomass operators?

This paper is structured into seven sections presenting the introduction, methodology, the conceptual framework, the developed rights-based food security principle with the selected criteria and their description, discussion and recommendations, and finally conclusions.

## 2. Methodology

We decided on a stepwise process for the development of the rights-based food security principle based on intensive stakeholder interaction. We started with a comprehensive review of available literature on the Human Right to Adequate Food (hereafter Right to Food) and on the various methods for measuring food and nutrition security. The aim was to identify a suitable assessment tool to measure impacts of biomass production on the food and nutrition security situation at the local level [40,49–54]. In a workshop with food security scientists we discussed how a valid assessment of the food and nutrition situation at local level could be done and how causality with the biomass production could be established given the typical situation of limited resources available for an audit, i.e. it is done at relatively low costs, within short time and without specific expert knowledge. This was complemented by consultations with experts of the Right to Food section and the Voices of the Hungry Project at the FAO as well as the World Food Program.

According to the definition of food security of the 1996 World Food Summit and the Right to Food, we designed a conceptual framework, which is described in detail in the next section. Based on the conceptual framework, the relevant themes and elements for the rights-based food security principle were identified.

In a next step, sustainability standards for biomass were assessed to gain an overview of already existing criteria and indicators based on the themes and elements of the conceptual framework, i.e. the criteria were grouped according to the selected Right to Food guidelines (see also Section 3). The screening process included the following ten standards: FSC, RTRS, RSPO, RSB, ISCC, Bonsucro, UTZ Certified, REDCert, the German multi-stakeholder Initiative on Sustainable Supply of Raw Materials for the Industrial Use of Biomass, and the Global Bioenergy Partnership Sustainability Indicators of the FAO [28–37]. This overview resulted in a list of social and environmental criteria and indicators that already cover the themes of the conceptual framework. The list formed the basis for the selection and specification of criteria for the rights-based food security principle. It helped to identify themes which were not already addressed by existing criteria and indicators. For these themes we suggested criteria (see Section 4). This resulted in the first draft of criteria for the rights-based food security principle.

Once the first draft existed, a larger stakeholder consultation process was initiated. Interviews and consultations took place with a total of ten experts from the ISCC Standard, the standard 'Cotton made in Africa', experts from the FAO, the World Food Programme and German Agency for International Cooperation/Forum for

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