

Introduction

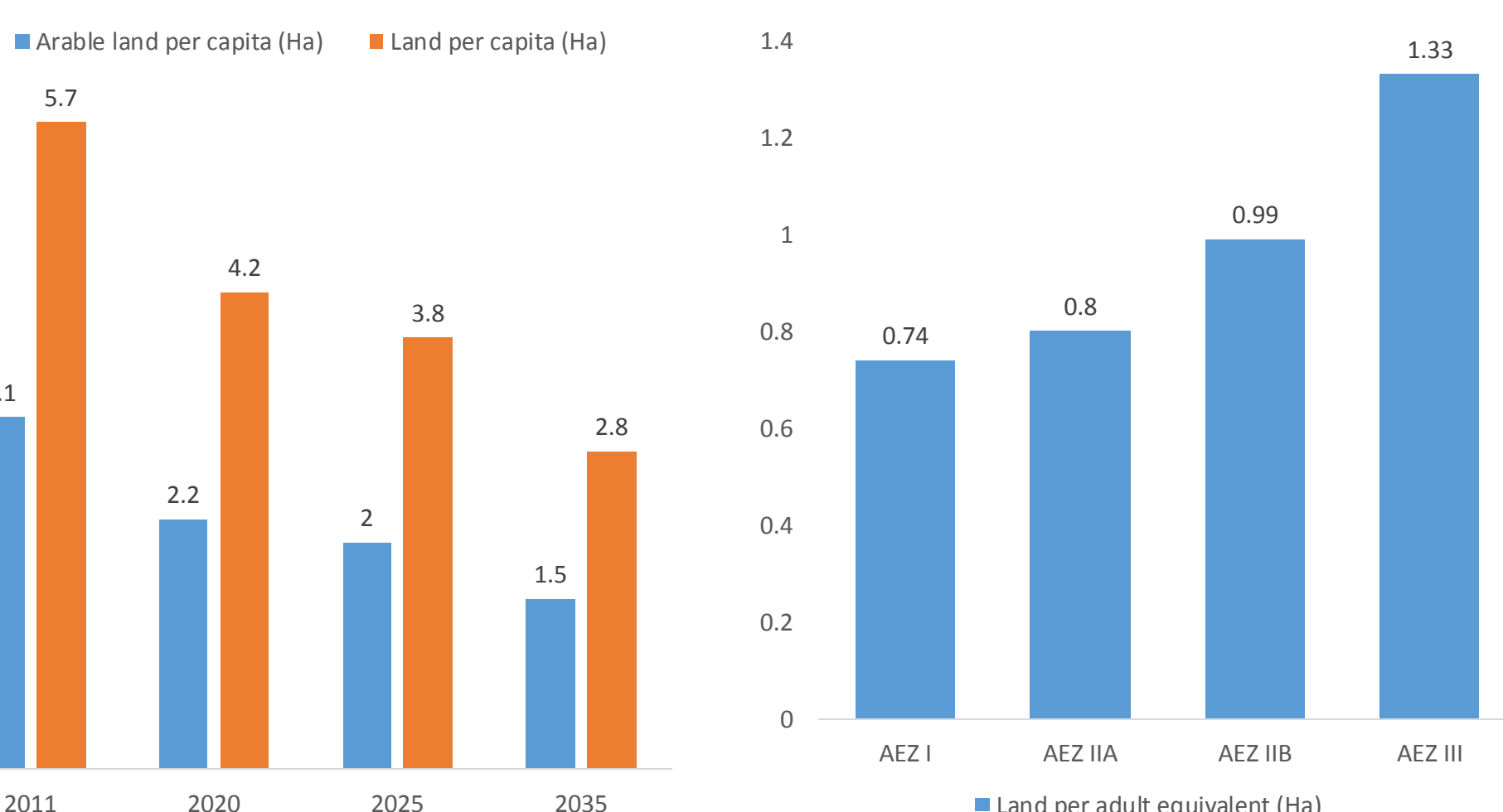
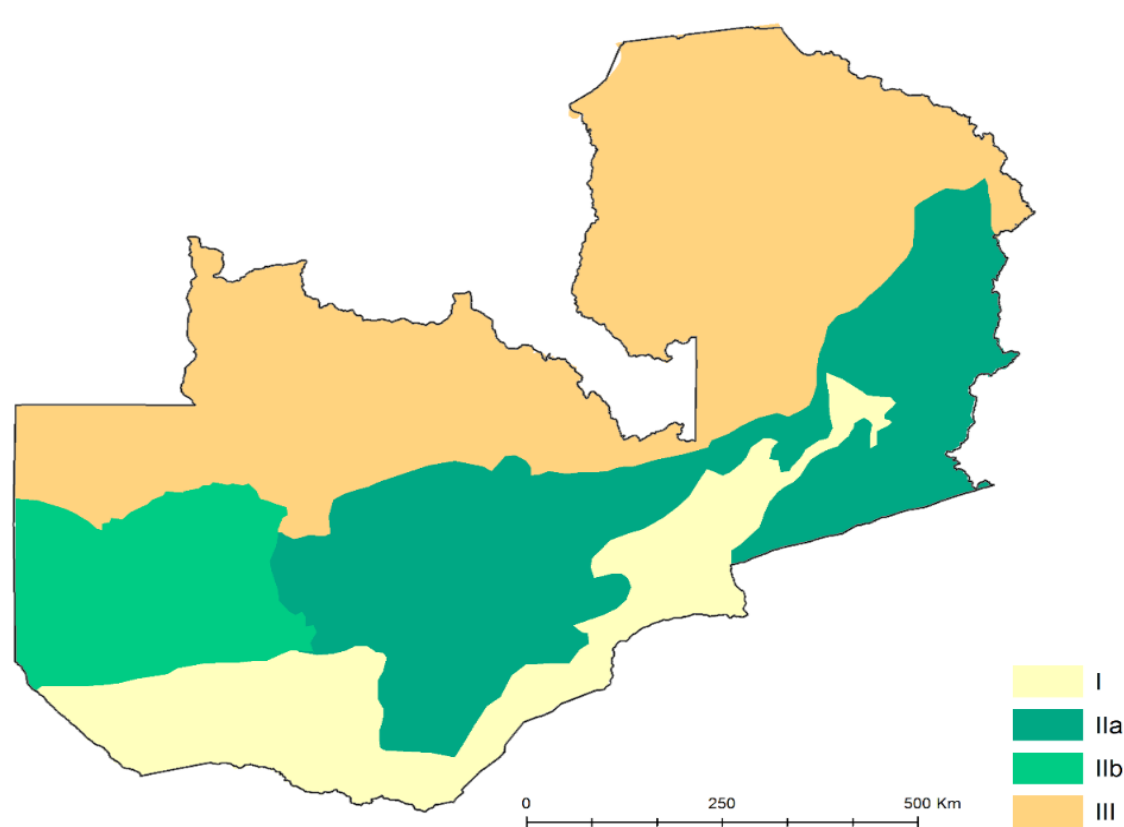
- ❑ Bioenergy production is expected to increase globally, in Africa, planned blending of liquid biofuels with petrol and diesel creates a large market for Southern African countries for bioenergy feedstocks and also biofuels.
- ❑ However, setting up viable industries requires an understanding of the biophysical and social constraints to production. More so that previously, projects failed to materialize. Further, it has become increasingly clear that there are tradeoffs that may come with biofuel investments given the evidence on the negative impacts of large scale agricultural investments.
- ❑ The biophysical constraint relates to agro ecological potential based on soil quality, water availability, and temperature favourability. We view social constraints as :
 - Factors that may worsen the situation of locals, and thus limit the odds of accessing finances from donors, and international financiers among firms wishing to invest in biofuels.
 - Factors that may increase the likelihood of projects facing opposition by the locals (e.g. land and water shortage).
- ❑ This paper analyses factors that may constrain bioenergy projects from moving beyond the design stage, while also yielding benefits to society and firms.
- ❑ We identify areas that are least likely constrained by either physical or social factors. While also identifying constraints to large scale led biofuel investments.

Methods

- ❑ Descriptive analysis using nationally (and in some cases district) representative and 2014/15 data on rural agricultural households.
 - Food security and Poverty (2015 Rural agricultural Livelihoods Survey).
 - Land (Central Statistical Office/Ministry of Agriculture Crop Forecast Surveys).
- ❑ Other secondary data sources were used to ascertain crop suitability and land availability. (i.e. Sipangula and Lay (2015), the Land Matrix's database of largescale land acquisitions).
- ❑ For information on compensation we consulted data from IFC client projects in Zambia This includes the Zambian Development Agency's list of expressions of interest in land acquisition.

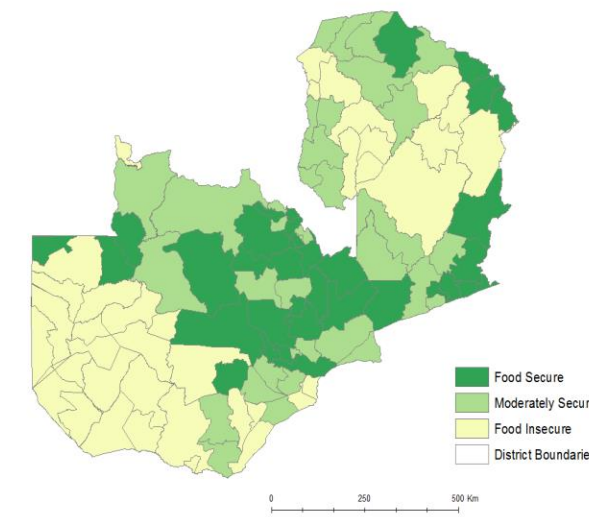
Biophysical Suitability

- ❑ Zambia has abundant land that can be utilized for feedstock production. With land to person ratio estimated at 5.7 hectares (Ha), this will still be higher than most industrialized and developing countries even in 2035.
- ❑ However, most of this land is located in inaccessible areas—a product of historical public infrastructure investments.
- ❑ The arable land is mostly located in areas that are highly suitable for agricultural (including feedstock) production (i.e. AEZ II and III). This covers 70% of the land mass.
- ❑ However, still, there are differences in land availability even among these suitability agro ecological zones.

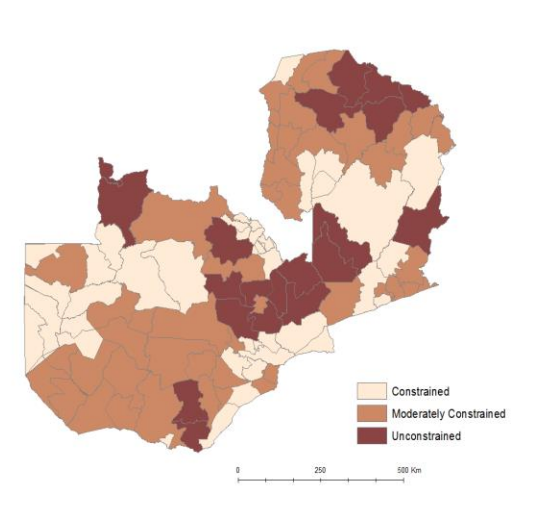


Suitability based on social constraints

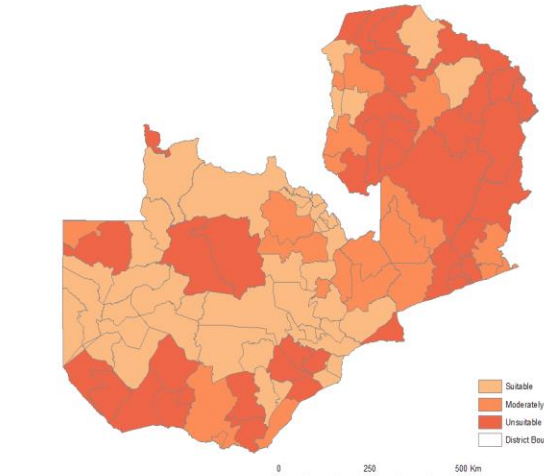
Food insecurity



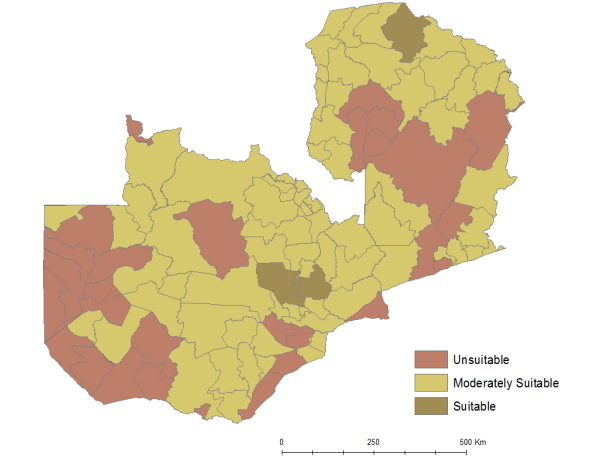
Small median plot sizes



Poverty



Overall social suitability



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Social Constraints to Large-scale Led Investments

- ❑ Considerable differences exist between experiences to set up and govern investments: there is a continuous elevated risk of negative social impacts to:
 - Community members who previously accessed land and resources
 - Resettled community members
 - Vulnerable and disadvantaged groups within these.
- ❑ Without improvements in the implementation of consultation, resettlement, compensation, much of the investment needed to reach production levels will need to come from funding sources with formal safeguard policies;
 - Biofuel projects will need to demonstrate upfront benefits to surrounding communities and those whose livelihoods are negatively impacted.
 - Time and cost needed to set up and run projects may be higher than originally anticipated;
 - This may affect the economics of biofuel production in favour of other models.

Potential Supply Given Biophysical and Social Constraints

- ❑ Overall we find Zambia well positioned to supply Southern Africa with bioenergy.
- ❑ The socially suitable areas largely coincide with the biophysically suitable areas save for very few cases in Luapula and Northern Provinces (i.e. AEZ IIB and AEZ III).
- ❑ This implies that most parts of Northern, Central, Luapula, Southern, and Copperbelt provinces are more attractive from a biophysical and social perspective.

