



Pursuing climate resilient coffee in Ethiopia – A critical review

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ABSTRACT

This paper provides a multi-scalar examination of the Ethiopian coffee sector and its pursuit of climate resilience. Concern is growing about the potential impact of climate change on Arabica coffee in Ethiopia and the 25 million livelihoods it supports. Arabica coffee has a relatively narrow envelope of climatic suitability and recent studies suggest that the area of bioclimatically suitable space for the species in its native Ethiopia could decline dramatically in the coming decades. We adopt a critical perspective on resilience that reflects on the situated nature of the ecology/science of coffee and climate change and the operation of social, economic, and discursive power across scales, paying particular attention to the differentiated impacts of climate change and associated resilience strategies. This analysis begins by reviewing Ethiopia's Climate Resilient Green Economy strategy and argues that the current lack of attention to coffee is inappropriate considering the coffee sector's vulnerability to climate change, economic importance and association with forests. The paper then examines the contemporary coffee sector which provides the context for reflecting on three potential responses to the threat climate change poses; a spatial response from farmers, adaptive farm management responses such as changing shade levels and the development of the country's genetic resources to cultivate improved varieties. The analysis explores the disconnect between the interventions emerging from national and international institutions and the local context. The multi-scale approach highlights the presence of complex normative trade-offs associated with pursuing climate resilience strategies and reinforces the importance of appreciating the dynamics which influence decision-making in the country.

1. Introduction

Since Arabica coffee (*Coffea arabica* L.) spread from Ethiopia to the Yemen peninsula, potentially as early as 575 CE (Anthony et al., 2002), coffee has become a globally significant agricultural commodity with more than a billion cups consumed every day. In 2014, more than 8.5 million tonnes were produced by 26 million farmers in 52 countries with an export value of 39.3 billion US\$ (ICO, 2016; UNCOMTRAD, 2014). Despite robust demand, concern is growing within the sector about the impact of climate change which could reduce the suitable area for growing Arabica coffee by up to 50% globally by 2050 (Bunn et al., 2015).

Although Ethiopia only accounts for 4–5% of global coffee production (ICO, 2016), it commands a central position in the sector

because it contains most of the global genetic diversity of Arabica coffee (Labouisse et al., 2008). This genetic resource is critical to developing varieties which are more resistant to the impacts of climate change, pests and diseases without compromising taste and quality (Hein and Gatzweiler, 2006; Mehrabi and Lashermes, 2017; van der Vossen et al., 2015). In addition to the global importance of Ethiopia's genetic resources, coffee plays a central role in the national economy and the livelihoods of approximately 4.5 million farmers (EEA, 2015). In 2014 the country produced 398,000 tonnes (ICO, 2016) with an export value of approximately 1 billion US\$ (UNCOMTRAD, 2014), with coffee accounting for 25–30% of total export revenues (Tefera, 2012). As elsewhere, coffee in Ethiopia is vulnerable to climate change. Modelling studies by Moat et al. (2017) suggests that the area of bioclimatically suitable space of Arabica coffee could decline between ~39 and 59%

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by the end of the century, depending on the emissions scenario.

Growing recognition of the vulnerability of coffee to climate change has amplified interest in developing resilience in the sector in Ethiopia (Kew, 2013). Addressing resilience, defined by Adger (2000:347) as ‘the ability of groups or communities to cope with external stresses and disturbances as a result of social... and environmental change’ is viewed as an imperative in Ethiopia’s coffee sector, enabling it to continue to contribute to the long-term economic and social well-being of the country, its citizens, coffee companies and millions of consumers. Despite the growing intensity of these calls, attention in the academic literature has focussed predominantly on the agro-ecology of the coffee crop (Davis et al., 2012; Jaramillo et al., 2009, 2011; Perfecto and Vandermeer, 2015) or structural issues in the international coffee market, particularly the asymmetries of power in the value chain, (Arslan and Reicher, 2011; Daviron and Ponte, 2005; Petit, 2007; Ponte, 2002) and generally neglected more nuanced, localised and field-based assessments of the social and economic dynamics which will underpin the capacity of sector to cope with and adapt to climate change.

Over the preceding decades, resilience has emerged as a major strand of interdisciplinary research and policy-practice at the intersection of society and nature (Folke, 2006). Although the term refers to a variety of theoretical and conceptual approaches to social-ecological problems, in general the field has been characterised by a normative, coherently systematic and reformist approach (Kull and Rangan, 2016). More critical approaches to researching socio-ecological problems (Robbins, 2012) tend to be less reformist and challenge institutional and social status quos. Here we adopt a critical realist stance (Forsyth, 2001) that does not deny the material realities of climate change or its impact on coffee and the consequential need to develop appropriate policy responses. But instead of adopting the normative framing of ‘mainstream’ resilience theory (Folke et al., 2005; Olsson et al., 2006; RA, 2010; Walker et al., 2004) this analysis focuses on the situated nature of the ecology/science of coffee and climate change, the operation of social, economic, and discursive power across scales and it pays particular attention to who wins, who loses, and the differentiated impacts of climate change and associated strategies developed or proposed in pursuit of resilience (Forsyth, 2008; Kull et al., 2015; Marino and Ribot, 2012).

This approach facilitates an interrogation of key concerns regarding the divergence of socio-economic and ecological research and the multi-scalar contestations concerning the subjects of interdisciplinary socio-ecological research (Christopher Brown and Purcell, 2005; Görg, 2007; Green, 2016; Mauro, 2009), in particular, in the pursuit of climate resilient coffee in Ethiopia. This study also extends the analysis beyond markets and states (Ostrom, 2010) and unravels the complexity of actual governance regimes which operate in diffuse, emergent, self-organising modes across a range of scales. In doing so we hope to enrich understandings of the complex issues facing policy-makers and donors seeking to pursue climate resilience. In particular, the study reviews the context in which discussions concerning climate resilience in Ethiopia’s coffee sector are occurring. This has been noted as an essential prerequisite for understanding the processes related to the development of climate resilience and adaptation strategies (Moser and Ekstrom, 2010).

The aim of this paper is to critically reflect on how emerging climate resilience strategies in Ethiopia’s coffee sector entail poorly articulated trade-offs between competing priorities among different actors. The analysis highlights how national and international discourses are at odds with local realities in ways which threaten to undermine both the aims of pursuing resilience and other broadly accepted imperatives such as equitably alleviating poverty. It is hoped this analysis will (1) contribute to the on-going challenge of increasing the legibility and coherence of national and international discourses on climate resilience with respect to local contexts, and vice versa (Adger et al., 2001; Keeley and Scoones, 2000, 2004; Nyssen et al., 2004); and (2) aid efforts to ensure the responses to climate change do not have worse impacts than

climate change itself (Marino and Ribot, 2012).

The paper is organised as follows. After describing the methods used in the study, Section 3 contextualises the study by reviewing the background and evolution of Ethiopia’s Climate Resilient Green Economy Strategy and outlining the case for addressing resilience in the coffee sector. Section 4 focuses on the principal state institutions associated with managing forests and coffee and the evolving structure of the coffee market and prevalent concerns regarding its functioning. Our analysis then, in Section 5, integrates this analysis with a critical review of the climate-coffee ecological literature and related emerging climate resilience strategies for the coffee sector. The paper concludes by reflecting on the general implications of the study.

2. Methodology

This study draws on mixed method fieldwork conducted in Ethiopia between December 2013 and October 2016. Specifically, the analysis draws on a series of 40 semi-structured interviews with purposively sampled key stakeholders in government agencies and non-governmental organisations across at National, Regional (Oromia Regional State), and District (Yayu and Dorani Woredas) levels. These geographic locations were selected due to their proximity to the Yayu Coffee Forest Biosphere Reserve, which was listed on the World Network of Biosphere Reserves by UNESCO in 2010 to protect coffee genetic resources contained within the reserve, and is a primary site of interest for coffee-forest management in Ethiopia. Individuals interviewed were selected to represent all of the key institutions concerned with managing the coffee-forest and the coffee sector in Ethiopia, including the Bureau of Agriculture and Natural Resources, Trade Bureau, Oromia Forest and Wildlife Enterprise (OFWE), Rural Land Administration, Oromia Environment, Forest and Climate Change Authority, the Ethiopian Biodiversity Institute (EBI), the Co-operative Promotion Agency, Oromia Coffee Farmers Co-operative Union and associated co-operatives, the Ethiopian Commodity Exchange, and Agricultural Development agents, local opinion leaders and senior Kabele¹ officials. The interviews were designed to elicit the formal and informal responsibilities, activities and challenges of the key actors involved in governing the coffee-forest landscape and coffee sector at various levels. With six respondents photo elicitation was used to facilitate interviews (Clark-Ibáñez, 2004; Harper, 2002). This flexible design enabled respondents to shed light on both the formal and informal dynamics of the sector across levels and enabled deeper insights than more structured or narrow data collection methods permit.

These interviews were complemented at the local level with a series of additional interviews with coffee farmers (n = 20), focus groups (n = 4, 1 male only participants, 1 female only participants and 2 with both male and female participants) and a household survey (n = 240; randomly sampled from 10 Kebeles, stratified by gender and wealth ranking). These methods, along with documentary and literature-based evidence are synthesised to inform the analysis of the emerging climate resilience strategies in Section 5. The analysis in this paper primarily employs qualitative methods, but also draws on the household survey data where relevant (Miles and Huberman, 1994; Punch, 2013).

3. Contextualising the Ethiopian case: Coffee and the climate resilient green economy

Relative peace has characterised the rule of Ethiopian People’s Revolutionary Democratic Front (EPRDF), an alliance of associated regional parties, since Derg leader Mengistu was disposed in 1991. The ensuing decades have seen considerable social and economic progress; the 2015 National Human Development Report identifies Ethiopia as

¹ Kebeles, sometimes called peasant associations, are the smallest administrative unit of government in Ethiopia and are constituted of several villages, known as *gots*.

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