

‘Triple wins’ or ‘triple faults’? Analysing the equity implications of policy discourses on climate-smart agriculture (CSA)

Article (Accepted Version)

Karlsson, Linus, Naess, Lars Otto, Nightingale, Andrea and Thompson, John (2017) ‘Triple wins’ or ‘triple faults’? Analysing the equity implications of policy discourses on climate-smart agriculture (CSA). *The Journal of Peasant Studies*, 45 (1). pp. 150-174. ISSN 0306-6150

This version is available from Sussex Research Online: <http://sro.sussex.ac.uk/id/eprint/75071/>

This document is made available in accordance with publisher policies and may differ from the published version or from the version of record. If you wish to cite this item you are advised to consult the publisher’s version. Please see the URL above for details on accessing the published version.

Copyright and reuse:

Sussex Research Online is a digital repository of the research output of the University.

Copyright and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable, the material made available in SRO has been checked for eligibility before being made available.

Copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

‘Triple wins’ or ‘triple faults’? Analysing the equity implications of policy discourses on climate-smart agriculture (CSA)

Linus Karlsson^a, Lars Otto Naess^b, Andrea Nightingale^c, John Thompson^d

^aDepartment of Urban and Rural Development, Swedish University of Agricultural Sciences, Sweden. linus.karlsson@slu.se

^b*Corresponding author.* Resource Politics Research Cluster, Institute of Development Studies, UK. l.naess@ids.ac.uk

^cDepartment of Urban and Rural Development, Swedish University of Agricultural Science, Sweden.
andrea.nightingale@slu.se

^dRural Futures Research Cluster, Institute of Development Studies, UK. j.thompson@ids.ac.uk

Abstract

This paper analyses contrasting discourses of ‘Climate-Smart Agriculture’ (CSA) for their implications on control over and access to changing resources in agriculture. One of the principal areas of contestation around CSA relates to equity, including who wins and who loses, who is able to participate, and whose knowledge and perspectives count in the process. Yet to date, the equity implications of CSA remain an under-researched area. We apply an equity framework centred on procedure, distribution and recognition, to four different discourses. Depending on which discourses are mobilised, the analysis helps to illuminate how, *first*, CSA may transfer the burden of responsibility for climate change mitigation to marginalized producers and resource managers (distributive equity). *Second*, how CSA discourses generally fail to confront entrenched power relations that may constrain or block the emergence of more ‘pro-poor’ forms of agricultural development, adaptation to climate change, or carbon sequestration and storage (procedural equity). *Third*, CSA discourses can have tangible implications for the bargaining power of the poorest and most vulnerable groups (recognition). The paper contributes to work showing the need for deeper acknowledgement of the political nature of the transformations necessary to address the challenges caused by a changing climate for the agricultural sector.

Keywords: political economy, triple wins, climate-smart agriculture, climate change, discourses

1. Introduction

Climate-Smart Agriculture (CSA) was introduced on the assumption of ‘triple wins’ and synergies between agriculture-based efforts to enhance adaptation to climate change, support efforts to reduce carbon emissions, while simultaneously increasing food security (FAO 2010, 2013, 2016; World Bank 2010). Under these three common goals or ‘pillars’, CSA encompasses a wide range of practices based on crop production, livestock, forestry and fisheries.¹ Over the past few years, CSA has gained considerable traction in policy and research (Lipper et al., 2014), directing new attention and resources to the agricultural sector, globally as well as at country levels. For example, more than 30 countries, most prominently in Sub-Saharan Africa, referred to CSA in their Intended Nationally Determined Contributions agreed at the U.N. Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP21) in Paris in December 2015 (FAO 2016). This growth in interest and funding for CSA has been accompanied by the emergence of new global and regional networks, notably The Global Alliance for Climate-Smart Agriculture (GACSA), the Africa CSA Alliance (ACSAA), as well as a multitude of conferences and online fora². There is also a growing literature assessing field experiences with climate-smart agriculture (Lipper et al., 2014; Rosenstock et al., 2016). It is therefore timely to ask what precisely CSA is purported to achieve and its implications for access to and control over changing agricultural resources.

¹ For an overview, see <http://www.fao.org/climate-smart-agriculture/knowledge/practices/en/>

² E.g. the Global Science Conferences on CSA (<http://csa2015.cirad.fr/>), climate-smart agriculture websites (e.g. <http://www.fao.org/climate-smart-agriculture/en/>), and a number of online fora (see <http://www.fao.org/in-action/micca/international-fora/join-online-discussions/en/>)

From the outset, CSA has been a contested concept. Critics have raised concerns that CSA may undermine the livelihoods of smallholder farmers, have negative effects on biodiversity, promote genetically modified crops at the expense of traditional crop varieties and hence undermine crop genetic diversity and local cultures, or that it may lead to accelerated land grabs by corporate interests and local elites (Stabinsky 2014; Suppan and Sharma 2011; Caron and Treyer 2016). Key to such criticisms is that, unlike for example conservation agriculture (Kimaro et al., 2016), CSA is a broad goal and approach, not a predetermined set of practices. Beyond its focus on transformation of agriculture in a changing climate and the notion of attaining ‘triple wins’³, CSA is not a prescriptive set of actions. CSA may be achieved through a number of different pathways, with widely diverging technologies, processes and actors. What actions and activities are rendered as ‘climate smart’, and what triple wins mean and for whom, are in turn shaped by who interprets the term and how it is applied.

In this paper we look at the contestations around CSA, with a particular focus on how different actors frame what CSA does and how it tackles problems associated with changing resources. We use a Rawlsian inspired framing of equity (Kandlikar and Sagar 1999; Rawls 1972), focused on distributional, procedural, and recognition equity, to unpack the claims made both by those supporting the idea of CSA, and those who oppose it.⁴ Equity is central to current international policies targeted at climate change. It underpins the Paris Agreement⁵ and the Sustainable Development Goals (SDGs)⁶, both of which relate closely to CSA policies and practices. For example, some consider CSA as a new opportunity to address longstanding equity challenges for smallholder farmers. Social equity and gender are often mentioned as important components of achieving CSA, as well as in guidelines for how to carry out and govern its implementation (World Bank et al., 2015; FAO, 2013; Vermeulen 2015). Common to these concerns and arguments, however, is that what equity means in the context of CSA is poorly theorized and inconsistently applied (Taylor, 2017, this issue). For example, Neufeldt et al. (2013:3) argue for what they call a ‘safe operating space’ for CSA, defined as a “set of conditions that demonstrably better meet human needs in the short and long term within foreseeable local and planetary limits and holds ourselves accountable for outcomes across temporal and spatial scales”. Without explicit attention to equity, we suggest that this and similar notions are problematic in that they implicitly assume that benefits for all can be achieved without (inherently inequitable) conflicts over access to and control over changing resources.

We therefore argue that CSA needs to be treated as a political project, as opposed to an outcome or set of tools for coping with climate change. While empirical studies of CSA remain limited and preliminary, CSA discourses bring different sets of actors in relation to changing agricultural ecosystems in ways that have important implications for control over and access to resources. The paper adds to a growing body of literature on climate justice, and ‘speaks back’ to policy at a time when many development actors appear to be uncritically riding the wave of CSA.

Our starting point is that CSA can be seen as set of *discourses*, or narratives, where debates – and outcomes – are influenced by the actors’ underlying ideas and ideologies, as well as the activities and priorities a ‘climate smart’ discourse sanctions. Discourses are sites for the exercise of power

³ The articulation of ‘triple wins’ varies considerably between actors. Some actors, such as the CGIAR’s Climate Change, Agriculture and Food Security programme (CAAFS) does not give priority to achieving triple wins, but rather draws attention to how multiple objectives interact at different scales and levels when implementing CSA in particular contexts. See <https://ccafs.cgiar.org/> (last accessed 25 May 2017)

⁴ For a counter critique of Rawlsian approaches to justice in relation to climate change, see Forsyth (2014).

⁵ The Paris Agreement is an international agreement under the UN Framework Convention on Climate Change (UNFCCC). The Agreement was negotiated by representatives of 195 countries at the 21st Conference of the Parties of the UNFCCC in Paris and adopted by consensus on 12 December 2015. <https://treaties.un.org/doc/Publication/CN/2016/CN.92.2016-Eng.pdf> (accessed 9 December 2016)

⁶ The SDGs are a new, universal set of 17 goals and 169 targets agreed by United Nations member states at the UN Sustainable Development Summit on 25–27 September 2015 in New York, USA, which are outlined in the document *Transforming our World: the 2030 Agenda for Sustainable Development*. The goals include ending poverty and hunger, improving health and education, making cities more sustainable protecting oceans and forests, and combating climate change. <http://tinyurl.com/z4o6pk4> (accessed 9 December 2016)

(Foucault 2003), they determine who is allowed to speak, as well as what knowledge becomes recognised as truth. CSA discourses exercise power through their ability to focus attention on some issues over others, define the scope of a problem, the scale at which it should be addressed, and the range of possible solutions to be pursued (Nightingale 2003; Keeley and Scoones 2003). The power of CSA discourses is thus to shape which equity goals are promoted, as well as the different actors' control over and access to resources; both processes that underpin inequalities.

To analyse how CSA discourses have implications for control over and access to changing resources, the paper examines three essential dimensions of equity, namely *distribution*, *procedure* and *recognition*. We draw these three equity dimensions from the literature on climate justice and related debates in environmental governance and conservation (McDermott et al., 2013; Schreckenberg et al. 2016). Together, they allow us to ask questions about who is considered responsible for climate change goals, how that maps onto historical and present day inequalities in emissions and burdens for mitigation, and how and by whom the goals of CSA are assumed to be enforced. We do this by examining four major narratives, the associated networks of actors and their power relations, and together how they have shaped actions and field-level activities on CSA. Despite recent shifts in the rhetoric around the approach, a large share of CSA-labelled activities are still focused primarily on mitigation, and assume that benefits will flow more or less automatically to those who need it. This has led to the shifting of responsibility for climate change mitigation efforts from international and regional actors to national governments, and more nefariously, to poor local producers and resource managers who are ill equipped to respond. CSA measures and the costs and benefits that accrue from their application will ultimately be politically negotiated, raising questions around who sets the terms of the agenda and how the poorest and most vulnerable groups are involved or excluded from decisions that affect their resources and their livelihoods.

The paper is based upon a review of scientific and 'grey' literature on CSA from 2009 to August 2016. In 2015, one of the authors visited a CSA initiative in Nepal that has promoted, among others, new micro technologies for increasing vegetable crop yields, more efficient grain processing technologies and rehabilitation of traditional ponds used for livestock and irrigation. Notes from the visit provided inputs to the analysis. Given that CSA is a relatively new concept, few studies have engaged in empirical investigations of CSA practices (but see recent review by Rosenstock et al., 2016). Thus, our paper is not an attempt to assess actual value and implications of CSA in practice, rather, we are interested in how the arguments and narratives that engender and create a discursive base for CSA policy and practice have implications for control over and access to resources. The document analysis was guided by an aspiration to identify the overall key discourses, potential overlaps, and sub- and counter-narratives at play in CSA debates. In particular we paid close attention to: relative emphasis on adaptation, mitigation and food security; the ways that synergies and triple wins are constructed; the extent to which political considerations are included; whether links to other issues on agricultural development (such as land, water, tenure) are made; whether emphasis is put on production of or access to food; at what scale the 'problems' and associated 'solutions' are believed to lie; and, conclusively, to what extent equity concerns are either explicated or implicated.

The literature can be divided into three categories: (1) official documents retrieved from the UN Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD), the World Bank, Global Alliance for Climate Smart Agriculture (GACSA), and Africa CSA Alliance (AACSA); (2) academic articles retrieved from Scopus, Web of Science as well as from major publishers such as Elsevier (www.sciencedirect.com), Emerald (www.emeraldinsight.com), Springer (www.springerlink.com), and Wiley (www.wiley.com). A database search using queries such as "climate smart agriculture" and "triple wins + agricultur* | climat*" gave a restricted number of articles; and (3) grey literature (including unpublished studies, reports from government and civil society organizations, conference proceedings, and working papers) retrieved from Google Scholar.

We begin with a brief background to 'climate-smart agriculture' (section 2) to provide a summary of its conceptual origins and its rise as a global agricultural development priority. This is followed by an overview of the analytical framework focused on the three dimensions of equity, and a discussion of

its relevance to on-going debates on CSA (section 3). Section 4 applies this framework to four key discourses associated with different aspects of the CSA agenda and chief protagonists associated with each of these. Finally, section 5 compares and contrasts these contending discourses and draws out a set of conclusions.

2. The emergence of climate-smart agriculture

The idea of climate-smart agriculture emerged in the context of increasing concern over food security given rapidly changing demographics and climate⁷ (Mann et al., 2009; FAO 2009). Studies showed that agricultural production will need to increase 60 per cent by 2050 even in the absence of climate change to meet projected demand by the middle of the 21st century (FAO 2009, Campbell et al. 2016). The United Nations Food and Agricultural Organization (FAO) stated that CSA, “(...) contributes to the achievement of sustainable development goals by integrating the three dimensions of sustainable development (economic, social and environmental) by: (1) sustainably increasing agricultural productivity and incomes; (2) adapting and building resilience to climate change; and (3) reducing and/or removing greenhouse gases emissions, where possible” (FAO 2013: ix-x). It went on to define CSA as “an approach to developing the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change...” (FAO 2013: ix-x).

From the outset, however, CSA represented first and foremost recognition of the possible contributions of agriculture to emissions reductions (Mann et al., 2009). This was rooted in the unique role of the agricultural sector as both a leading contributor to carbon emissions as well as a sector with high vulnerability to climate change. In the CSA narrative, agriculture is portrayed as both a major ‘victim’ by being severely exposed to impacts of climate change, as well as a ‘villain’ in being a major contributor to greenhouse gases (GHG) (Smith and Olesen 2010; Hedger, 2011; Vermeulen et al. 2015). For example, globally 22 per cent of the cultivated area for the most important crops and 56 per cent in Sub Saharan Africa are projected to experience negative impacts from climate change by 2050 (Campbell et al. 2016). Often-cited figures are that global yields of maize and wheat have already decreased by 3.8 and 5.5 per cent respectively (ibid). At the same time, an estimated 10-12 per cent of the global GHG emissions come from crop production.

It seems beyond dispute that agriculture must be central to any strategy for tackling climate change and its impacts. Yet, when analysing how different actors and communities of practice imagine CSA, it becomes clear that the envisaged gains and trade-offs vary considerably and attract some of the sharpest critiques from detractors. In part this is because CSA entered arenas characterized by long standing contestations and long-standing, entrenched positions around the aims and means of agricultural development (Sumberg and Thompson 2012). These include, but are not limited to, discussions around multifunctional agriculture, sustainable land management, sustainable intensification, agroecological approaches, and conservation agriculture, to name a few (Thompson and Scoones 2009; Sumberg, et al. 2013).

The World Bank and UN bodies have embraced the CSA agenda and initiated projects to showcase its potential (World Bank 2011; FAO 2014). With examples from South and South East Asia, Africa and South America, a variety of practices have been identified that can be incorporated under the CSA framework, including: introducing cash crops to subsistence farmers, improving irrigation capacity and efficiency, training in sustainable resource management, carbon sequestration and mitigation, introducing energy-efficient cooking stoves to reduce deforestation, reforestation through plantation schemes, construction of biogas digesters, and improving genetic diversity (FAO 2014). Within these, there is potential for very wide interpretations of what CSA is or should be, and indeed, it reads like a “laundry list” of natural resource related development schemes over the past thirty years.

⁷ This is elaborated in the High-Level Expert Form Issues Paper on ‘Global Agriculture Towards 2050’ (FAO 2009) http://www.fao.org/fileadmin/templates/wsfs/docs/Issues_papers/HLEF2050_Global_Agriculture.pdf (accessed 9 December 2016).

Because these activities are so diverse and encompass a large array of activities with widely diverging objectives, some have argued that CSA leans on a poorly understood and somewhat tenuous relationship between mitigation, adaptation and food security, and hence serves to justify nearly *any* agricultural practice to be ‘climate-smart’ (Neufeldt et al. 2013). Indeed, our review of recent literature shows that CSA is used by advocates of activities spanning fields as diverse as sustainable intensification, agroforestry, agroecology, conservation agriculture, tenure formalisation and land titling, carbon sequestration and REDD+ programs, knowledge creation and dissemination, market integration, technology innovation and transfer, and the use of fertilizers, pesticides and GM crops.

While several international organisations, including the FAO, the International Fund for Agricultural Development (IFAD), the World Bank and a number of agricultural research centres and programmes (such as the World Agroforestry Centre (ICRAF), and the CGIAR’s Climate Change, Agriculture and Food Systems Program (CCAFS), have endorsed CSA as a policy goal, other groups of actors have levelled sharp criticisms. These include, but are not limited to: ethical challenges to the goal of increasing smallholder participation in carbon markets; the emphasis on technology development and transfer; the prevalence of support for agro-industrial expansion; and the exclusion of smallholder voices and priorities (e.g. Atela, 2012; Suppan and Sharma 2011; Anderson 2014; Pearce 2011). Initial scepticism also centred on the manner in which agriculture was introduced in international climate negotiations. Negotiations predominantly focused on mitigation, drawing agriculture into contested issues relating to agricultural trade (Caron and Treyer 2016; Stabinsky 2014). Many of the critiques were not based on evidence of how CSA would appear on the ground, but rather were focused on CSA strategies (i.e. the discourses of CSA), as well as the track-record of the leading organisations promoting it, notably the World Bank (Suppan and Sharma 2011; Taylor 2016). Because of how these negotiations were focused, concerns were raised that climate change and agriculture initiatives, including CSA, were introducing emission reduction targets ‘through the back door’ for some of the poorest and most vulnerable farmers in the world (Chinsinga et al. 2012).

Furthermore, critics have emphasised that CSA activities tend to focus on industrial agricultural practices where the biggest emission reduction gains can be found, rather than on improving food access or reducing vulnerability (Adekola and Terdoo 2014, Anderson 2014). In comparison to industrialised contexts, the per capita contribution to global climate change is low in agrarian societies, and at the same time, poverty levels are high and vulnerabilities to the effects of climate change significant (Stabinsky 2014). These inequalities, in tandem with the fact that the ‘Global North’ carries the historical responsibility for anthropogenic climate change, makes it politically controversial to connect climate change interventions to farming practices in the global South. Following this argument, some claim that reconciling adaptation, food security and mitigation is viable neither from a historical responsibility nor climate justice point of view (Stabinsky 2014).

Recent activity on CSA has responded to this early critique with several contrasting approaches. International organisations have placed more emphasis on landscape-centred approaches that focus on CSA benefits to be found at larger scales, rather than at project or programme level, to avoid situations where mitigation and adaptation actions are artificially combined and result in sub-optimal outcomes (Harvey et al. 2013). In contrast, many development NGOs have instead put more effort into local level interventions and made CSA ‘their own’, notably through smallholder-focused initiatives under CGIAR’s CCAFS (Bernier et al., 2013). As a third approach, the Africa CSA Alliance (ACSAA), is seeking to leverage existing CSA initiatives in several countries to deliver results at scale and drive policy reform. This multi-actor effort, convened by the African Union through NEPAD’s Comprehensive Africa Agriculture Development Programme (CAADP), including a range of international and regional agencies, governments, research bodies and civil society organisations,⁸ is an attempt to rectify critiques of CSA while continuing to operate across scales.

⁸ <http://csa.octoplus.co.za/> (accessed 9 December 2016)

Not all critics have chosen to engage in reforming CSA, however. In 2014, more than 100 civil society organizations signed a joint letter rejecting the Global Alliance for Climate Smart Agriculture (GACSA), arguing that because of its vague definition, CSA legitimises agro-industrial expansion and socially and environmentally destructive activities that increase GHG emissions⁹. Their critique also raised questions about the necessity of carbon offsetting and revenues from carbon trading schemes for funding CSA. They fear carbon trading will create demand for lands in the Global South, leading to land dispossessions for populations without recognizable property rights. Finally, this coalition remains concerned that GACSA places burdens on the most vulnerable populations by expecting poor farmers in the global south to contribute to global mitigation efforts (Anderson 2014, Via Campesina 2014). Thus, to those who reject it, CSA remains focused on supply-side, agricultural production efficiency along with governance structures that help to sustain the legitimacy of development as a metaphor for technology transfer and market integration, without addressing the underlying vulnerability of poor farmers.

At core, these counter narratives consider CSA to be a ‘green-washing’ project and a prolongation of the Green Revolution, resulting in increased indebtedness, vulnerability, GHG emissions and environmental degradation. Using historical narratives of injustice and development failures, opponents seek to re-politicise the debate by showing that CSA masks structural impediments for pro-poor development (Via Campesina 2014, Anderson 2014). Via Campesina (2014), for instance, has argued that CSA is ‘part of a larger process of ‘green’ structural adjustment projects required by an economic system and political elites in distress ...[who] see agriculture and agricultural land as the new frontier.’ They thus argue the practices advocated by CSA create food insecurity in the first place; namely reliance on agro-industrial practices and corporate control over inputs and seed stocks.

These contrasting claims show how differently positioned actors use different discourses of CSA to frame the same problems. In some narratives, it becomes a vehicle for equitable control over and access to resources on a changing planet, while for others CSA undermines attempts at more equitable distribution of climate burdens. We find it remarkable how CSA has circulated so widely and so quickly globally, despite these profound criticisms from social scientists and civil society organisations.

3. Theorizing equity in the context of climate-smart agriculture

Given the ways that actors across the spectrum tend to insist that CSA will either solve or exacerbate core questions of control over and equitable access to changing agricultural resources, we now take a more conceptual look at different dimensions of equity to unpack these competing claims. We suggest that while there is nothing fundamentally ‘new’ in CSA, the discourses of CSA serve to reorient climate change mitigation and adaptation or agriculture debates on certain issues, which in turn may change or reinforce current political economic inequities. This reorientation highlights the need to ‘insert’ power and politics into the CSA debate in order to probe the ways CSA travels and transmutes across scales, how various actors use it and for what purposes, how it informs policy and materializes on the ground, and ultimately who have been the winners and losers in this process.

Climate change and agriculture can be considered as an integrated policy complex, where the implications are significant both environmentally and socially for those who are affected, and financially for those who may stand to gain from climate or CSA funding. In this paper we view policy processes as ‘incremental, complex and messy’, involving actors with often competing goals and interests, which invoke evidence provided by research in less than straightforward or transparent ways (Keeley and Scoones 2003, Tanner and Allouche 2011). This is in contrast to a rational-positivist-linear view, which is based on assumptions that technical knowledge is available and communicated to policy-makers, who then make policies grounded in a thorough understanding of ‘the problem’ (Keeley and Scoones 2003). As policies are focused on stabilizing an interpretation of how to implement change (Fischer 2003), they have to be coherent across actors, interests and scales.

⁹ <http://www.climatesmartagconcerns.info/cop21-statement.html> (accessed 9 December 2016)

Policies achieve this coherence by drawing on discourses that are adequately flexible and ambiguous, and give enough room to manoeuvre for parties with different goals and interests, and CSA is no exception. Thus, the mobilizing narratives that drive policy making, such as ‘sustainability’ or ‘triple wins’, in practice may recede into the distance in favour of direct impacts achieved through political relationships and management procedures that can be included in narratives of ‘success’ (Sumberg, et al. 2012). Recent work has shown how such processes – through a variety of mechanisms - may push the debate in certain directions to bring some opportunities but close down others, jeopardizing goals of implementation (Ojha et. al. 2015). This can set policy on pathways that lead to outcomes shaped by these discourses, but do not necessarily reflect the original aims (Leach et al., 2010), and more importantly for our purposes, have tangible effects on access to and control over resources.

Therefore, fundamentally we consider CSA narratives as political projects that influence policies and on the ground practices. Focusing on the systemic ways that CSA as a concept is adopted by a variety of institutions, re-articulated in policy and translated into practice allows us to better illuminate its political nature. Discourses used by different actors are shaped by their backgrounds and interests, and determine the types of evidence and knowledge that is included or excluded, the types of priorities that are being made, and by whom (Nightingale 2005). Discourses reflect power relations, and power is exerted through discourses (Foucault 2003). For example, debates on complex social and environmental issues have been shown to close down – sometimes very quickly – around certain types of discourses and solutions, effectively blocking alternative narratives and actors (Leach et al., 2010). In our effort to capture such political dynamics, we therefore put emphasis on different narratives and their histories with CSA, and examine how they are framed, what kinds of knowledge and evidence they draw upon, the associated actors, and the kinds of policies and practices to which they are linked (Keeley and Scoones 2003).

Thus, while it is clear that a range of practices may be deemed ‘climate smart’ from the narrowly defined perspective of adaptation, mitigation and food security, the question is to what extent they can also be considered equitable, and if so, according to what understanding of equity. Who is defining the goals? Whose responsibility? Who is ultimately accountable? Who wins and who loses? To examine these questions, we use a framework focused on three dimensions of equity, informed by broader conceptualisations of equity and resource access (McDermott et al., 2013; Schreckenberg et al. 2016). Within climate change debates, the major equity issues have revolved around the distribution of impacts; distribution of responsibility for emissions; and distribution of costs and benefits (Ikeme 2003). However, there is considerable disagreement over exactly what is to be distributed, why, how, to whom, and on what scale. For some, distribution is a form of corrective justice for historical emissions (Agarwal and Narain 1991; Hyder 1992). For others it is rather a question of minimising climate impact and delivering global ecological health (Wigley et al., 1996; Azar and Rodhe, 1997; Tol, 1999). Distribution involves, in short, normative choices that can be either explicit or implicit. The redistributive effects of CSA have not been thoroughly probed. Yet, CSA discourses and policy-work inevitably involve choices of redistribution which, per definition, produce winners and losers.

We therefore introduce *distributive equity* as a conceptual device. Distributive equity is focused on distribution of costs, risks and benefits and has strong correlation with the economic dimensions of equity (McDermott et al., 2013; Schreckenberg et al., 2016). We consider distributive equity to relate to the sharing of benefits and costs and risks emanating from CSA interventions, importantly around who the intended beneficiaries are, and how interventions are justified. These may include both instrumental or efficiency concerns, as well as rules- or moral-based concerns. For each of the discourses, we ask whether and how there is attention to winners and losers, how these are justified (e.g. based on efficiency or needs of the poorest), and whether there are benefits and burden-sharing arrangements in place. By analysing discourses, we hope, in short, to lay bare CSA’s different distributive effects, as well as the values or principles upon which they rest.

More is at stake than forms of redistribution, however. Kandlikar and Sagar (1999) argue that perceived fairness or equitability of an outcome rests on the legitimacy of the process by which it is

determined. This argument is based on the Rawlsian idea that a fair bargaining always produces a fair result. A fundamental element in a fair negotiation process is, therefore, participation (Rawls 1972). In relation to redistributive equity it is therefore important to examine *procedural equity*. Procedural equity is focused on participation and representation in decision- and policy-making processes, which may include, on the one hand, guaranteeing equal basic rights among all actors, and on the other, positive bias to marginalised or excluded social groups (McDermott et al., 2013). We here interrogate the CSA discourses with respect to whether and how they define the role of relevant stakeholders, accountability for decisions, responsibility for actions, and how meaningful participation is ensured for relevant actors, in particular those who are the most vulnerable and most in need of support.¹⁰

However, equal participation and representation requires the *recognition* of different values, beliefs, knowledge systems and institutional arrangements (Fraser 2008), and by extension the recognition of different forms of access, constraints, capabilities and abilities to gain from a given intervention or mechanism (McDermott et al., 2013; Schreckenberget al., 2016). In short, representation and participation is dependent upon a recognition of particular contexts (social, political, economic and environmental) that position people differently in relation to climate-related risks, ability to access mitigation-focused interventions such as low carbon technologies, as well as constraints and barriers to benefitting from agricultural development. Thus we here map to what extent different CSA discourses recognize such underlying heterogeneity.

In the following, we examine CSA along these lines of distribution, procedure and recognition. This approach, we propose, allows us to unpack CSA discourses and make visible their respective equity dimension.

4. Equity in four climate-smart agriculture discourses

This section is organised around examining four key discourses of CSA in relation to how they frame access to and control over changing resources, using the equity framework introduced above. The discourses are distinguished by the purpose CSA holds, and for whom, as well as their relative emphasis across mitigation, adaptation and food security. They differ in their historical trajectories and entry points to climate change-agriculture linkages, their justification, associated actors, knowledge and actions, scale and outcomes. While there is no watertight separation between them, or their affiliated actors, they serve to highlight some main streams of CSA debates, and the underlying assumptions which shape access to and control over resources within their paradigms.

4.1 CSA as a global climate policy mechanism

CSA as a global climate policy mechanism begins by framing the agricultural sector as both a major source of greenhouse gas emissions, and vulnerable to impacts from climate change (Mann et al. 2009, Hedger, 2011). Key actors affiliated with this discourse include the FAO (who coined the term), the World Bank, IFAD and a number of bilateral donors, including DFID, NORAD and the Netherlands. When introduced by the FAO, the initial emphasis was on ‘the opportunities that agriculture provided in addressing adaptation and mitigation within the agriculture sector, but with a particular focus on mitigation (Mann et al., 2009). It soon expanded to include food security, and the notion of ‘triple wins’ (FAO 2010; World Bank 2010) was a key motivation for the – ultimately unsuccessful – efforts to create a separate agricultural programme under the UNFCCC in the run-up to the Durban Conference of the Parties to the Climate Convention in 2011.

The possibility for new and additional financial resources through the UNFCCC to address mitigation and adaptation through the agricultural sector raises *distribution equity* questions. The Clean Development Mechanism (CDM), which was intended to support both climate and development

¹⁰ In our other work we have probed the limitations of participatory processes in development (Nightingale, 2005; 2015). However, we also recognise that failure to attempt inclusive processes, particularly at the discursive level, is equally problematic.

goals, had failed to meet expectations for funding in many poor countries, notably in Africa, which has received less than 3% of the overall CDM funding¹¹. In this context, CSA arrived as a new mechanism with the potential to redress such regional imbalances. The need for support to the most vulnerable populations was also recognised in the UNFCCC, and a focus on agriculture had long been justified as a way of harnessing the agricultural sector potential for reductions in carbon emissions. Estimates showed that nearly three quarters of all agricultural carbon emissions originate in developing countries, and that 70 per cent of the agricultural mitigation potential can be realised here (Gattinger et al., 2011).

Yet because CSA is not a tool kit or method, there is a lack of clarity on how funding for CSA is benefitting the poorest and most vulnerable people, both in terms of how priorities for CSA are set, and through which mechanisms. Approaching CSA from a (mainly) mitigation perspective, for example, implies a focus on the potential to maximise carbon sequestration, which largely addresses global goals. Mitigation places emphasis on projects that maximize carbon benefits rather than on where vulnerability is most severe or food security needs most urgent. The link between CSA and the carbon market has been a particularly contentious point. A recent study argues that there is little evidence to show whether and how smallholder farmers may benefit from carbon markets (Chandra et al., 2017). Bernier et al. (2013) shows how the carbon benefits in an agroforestry project in Kenya were negligible compared to other benefits from tree planting. Civil society organisations in particular have argued that CSA in effect could displace mitigation responsibility from the global North, and re-scale it onto poor and vulnerable populations by situating the causality of the problem in current agricultural practices in the South.

Another concern from a distributive equity perspective has been that within CSA programs emphasising adaptation, it is not clear that benefits are equally distributed or that burden-sharing arrangements are in place. In Nepal, for example, there is a long history of addressing equity issues in natural resource management (Nightingale, 2005), but there nevertheless is a tendency for recent CSA interventions to focus on areas that are more accessible (i.e. near roads) and on households where take adoption of new technologies is more fail-safe (those with some literacy). One project, for example, works close to an urban centre and has admitted that for logistical reasons, many of their projects are accessible by road¹². In this case, access to new financial resources intended for CSA is therefore not equitable, and in fact can arguably serve to exacerbate inequities induced by changing climatic conditions.

International bodies and processes have nevertheless continued to highlight the potential of CSA to address mitigation concerns. They have portrayed it as fostering greater coherence between climate and agricultural policies, arguing that mitigation can often be a significant co-benefit of actions to improve food security and adaptation, but realizing this benefit may involve additional costs. Identification of the costs of low-emission growth strategies compared with conventional high-emission growth paths can help to link agricultural development efforts that generate mitigation co-benefits to sources of climate finance (Lipper, et al. 2014).

From a *procedural* equity perspective, a key contentious point in UNFCCC discussions on agriculture and climate change has been around the transparency of CSA-related efforts, and whose priorities are at the forefront. One example here is the effort to introduce a separate agricultural work programme under the Climate Convention, which was placed under mitigation-focused sections of the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC. This raised concerns over the role of smallholders' concerns in CSA, and notably whether CSA is implicitly a way of shifting mitigation responsibility to smallholder farmers at the expense of their primary concern about incomes, risks and food security. In turn, this led some critics to refer to CSA in this context as

¹¹ See <http://www.cdmpipeline.org/cdm-projects-region.htm> (accessed 25 May 2017)

¹² Personal communication, 2015. It should be noted that accessibility issues in Nepal are significant. Many of the most vulnerable populations live several days walk from roads, and even those with road access can be difficult to reach in bad weather.

“Corporate-Smart Greenwash” (Anderson 2014, Via Campesina 2014). The controversy over its mitigation focus was also one of the reasons why African countries withdrew support to an agricultural work programme ahead of the COP in Durban in 2011, after initially being supportive. Given these criticisms, this CSA discourse fails to tackle – and may arguably reinforce – significant global inequalities in processes for tackling climate change.

From a *recognition* equity point of view, this discourse has at its core that CSA can help protect from increased climate risks among poor and vulnerable people by utilising the potentials that the agriculture sector provides, and increasing food security (Lipper et al. 2014; Mann et al. 2009). Although not typically framed as a human rights issue, the recognition of this role of agriculture has a strong normative equity component connected to access to resources. At the same time, the implicit, if now less visible, focus on mitigation in CSA has raised numerous concerns over the extent to which there is a recognition of the contextual drivers behind vulnerability among the poorest farmers, and notably whether the focus on benefits from the carbon markets, contested and as yet unproven, would lead to further marginalisation of smallholder farmers in accessing new financial resources and retaining control over their land.

4.2. CSA and agricultural transformation

The emergence of CSA occurred in parallel with a renewed interest by the international community in improving global food security to meet a rapidly growing population, following a series of food price spikes and food-related riots in over 30 countries in 2007-8 (Berazneva and Lee, 2013; Hossain et al., 2014). Thus, a second discourse on CSA has arisen which is linked closely to an agricultural transformation agenda and influenced strongly by Malthusian concerns. This is associated with a production-innovation narrative which stresses the importance of modern science and technology for raising agricultural productivity in order to increase food production by 60 percent by 2050 to accommodate a projected global population of nine billion (World Bank, 2007; FAO, 2009; Thompson and Scoones, 2009). Unlike the previous discourse, climate change is framed as a both an inhibiting factor compounding serious food and agriculture challenges and as an opportunity for developing more resilient and sustainable agricultural approaches. In both senses, it increases the urgency of finding new solutions to agricultural problems, which provides a key entry point for CSA practices and packages. This discourse can also be characterised by the convergence of a number of agricultural development strategies, notably Conservation Agriculture (Kimaro, et al., 2016), Sustainable Intensification (Campbell, et al., 2014) and Agroforestry Systems defined as ‘Evergreen Agriculture’ (Garrity et al., 2010). To one degree or another, these innovations are portrayed by their promoters as ‘Climate-Smart’ and therefore an essential part of moving the CSA agenda forward.

In Sustainable Intensification (SI), we find justification for an efficiency- or consequence-based view on *distributive equity*, both in terms of more economic efficiency for income per unit product, and in terms of gains coming through predominantly high-input, technology-focused interventions. Most SI commentators agree that the majority of this will need to come from innovative crop science advances, if yields are to increase without adverse environmental impacts or the cultivation of new land. Novel research methods have, the argument goes, the potential to contribute to food production through forms of genetic improvement, including the modification of crops that have been altered to introduce new and desirable traits. The focus on increased efficiency and high input agricultural production sit awkwardly alongside approaches focused on improved access to resources and safeguarding of access to crop genetic diversity, including traditional varieties.

A related argument is that for farmers to benefit from new practices and technologies, access to markets needs to improve. This has brought many to support market expansion and integration as a means to increase farmers’ participation in economies of scale (c.f. Nyasimi et al. 2014; FAO 2014). Market integration is presented as a ‘climate-smart’ strategy to alleviate poverty and food insecurity through adoption of CSA technologies such as drought tolerant varieties (intensification of production), and providing access to markets for producers to sell their output (adaptation through

increased income). This has been associated with a push to commercialise small-scale agriculture and steer production away from subsistence crops to cash crops.

Supporters of these ‘productivist’ approaches argue that they can drive climate-resilient agricultural transformation by: (a) reducing land degradation by improving soil and water conservation; (b) decreasing dependency on external inputs, such as inorganic fertilisers; (c) increasing agricultural productivity per unit area and reducing yield gaps; and (d) improving carbon sequestration and storage by using minimum tillage in conjunction with cover crops and multi-purpose tree species. They also claim that they offer considerable equity benefits by increasing agricultural productivity and reducing reliance on inputs and by shifting the labour burden (particularly for women) away from land preparation and weeding towards more productive activities. For example, promoters of Sustainable Intensification argue that it is a “cornerstone of CSA, as increased resource use efficiency contributes to both adaptation and mitigation via effects on farm incomes and reduced emissions per unit product” (Campbell et al., 2014: 41). This points to a construction of CSA’s triple wins where adaptation has become synonymous with increased income and the focus on reduction in GHG emissions per unit output.

However, this has implications for *procedural equity* in that it presumes access to supporting institutions, which are often neglected by promoters of these production innovation approaches. For example, a detailed examination of agricultural systems in the Central Africa Highlands found that constraints to sustainable intensification were mainly economic and institutional in nature, caused by the absence, or poor functioning of, institutions such as policies and markets, limited capabilities and financial resources, and ineffective interaction and collaboration between stakeholders (Schut et al., 2016). The authors found that addressing these constraints would require short- and middle-term institutional innovations, combined with middle- to long-term NRM innovations across farm and national levels.

These production-oriented approaches can take many forms and be pursued in a number of ways. For instance, on the one hand, sustainable intensification is presented as a way for farmers to increase their incomes from agricultural production without contributing to environmental degradation through encroachment into forested or other non-agricultural landscapes. On the other hand, as put forward in an influential report from the UK Royal Society (Royal Society 2009), there is a discourse arguing for the sustainable intensification of the global agricultural system. From a ‘globalist’ perspective, the challenge is presented as largely a technical one of how to meet future demand for food on an area of land that is unlikely to expand (Campbell et al., 2014). From a *recognition* lens, however, other questions about how poor farmers will be able to retain control over their land and access new technologies and markets under CSA models remain unaddressed. By lumping ‘agriculture’ into one big category requiring intensification, CSA fails to acknowledge the significant differences between farmers globally as well as within the global south.

Nevertheless, the ‘global sustainable intensification’ narrative has been powerful in the CSA debate. This may be at least in part because the ‘problems’ being addressed by CSA are primarily framed as global in nature, necessitating global solutions. One way to ‘sustainably’ intensify production from a globalist perspective is through technology transfer and innovation. The challenges inherent in the need for location-specific solutions, acknowledging the diversity of livelihood strategies of small-scale farmers and their needs are obscured within such a globalist perspective, making it difficult to address recognition equity issues at that scale.

4.3. Promoting agro-industry

In many respects, CSA from its conception opened up space for agro-industry to take a leading role in defining what counts as ‘climate smart agriculture’. The initial FAO documents outlining CSA acknowledged that a large share of new funding would need to come from the private sector (FAO, 2010). As a result, global agro-businesses were invited to articulate what activities should be funded under the framework of CSA, and hence shape what was to be included and excluded in its translation

from policy to practice. Agribusiness companies, including Yara, Monsanto and Syngenta, have branded their products such as fertilisers, pesticides and GM crops as ‘climate-smart’ since they can be applied to increase production and reduce on-farm GHG emissions through various synergistic mechanisms.¹³

One commonly cited synergy mechanism is found in herbicide-tolerant crops. The logic is that the crop can be sprayed with the herbicide as it grows, so that the weeds die back, but the crop remains standing. This practice reduces the need to till the soil for weeds, and hence reduce carbon leakage from the soil. Using this seed in combination with the Glyphosate herbicide, has been promoted by the agro-chemical industry as a ‘climate-smart’ zero till practice that will enable farmers to earn extra money from carbon offsets (Neate, 2013; Anderson, 2014). International corporations such as Wal-Mart, Kellogg’s and McDonalds have also highlighted CSA to justify activities¹⁴. McDonalds, for example, has pledged to start purchasing beef from ‘sustainable’ sources consistent with the principles of CSA.¹⁵ What a sustainable source is, and how this fits within a CSA framework remains unclear, however.

The agro-industry discourse focuses on the role of agriculture as an ‘engine of economic growth’ and is frequently based on evolutionist assumptions about the economic and social transformation of the agrarian economy – from backward to modern, from subsistence to market-orientated, from the ‘old’ to ‘new’ agriculture (World Bank, 2007). While this narrative incorporates key dimensions of the production-innovation narrative described above (as part of the transformative elements needed to bring about change), its emphasis is firmly on the catalytic role of agriculture. The central argument is that no country has been able to sustain a rapid transition out of poverty without raising productivity in its agricultural sector (Lipton, 2005). Much of this debate has been led not by agricultural scientists and engineers, but by economists and corporate leaders. Consequently, it has influenced the policies and programmes of key international development agencies, particularly the Bretton Woods institutions of the World Bank and the International Monetary Fund, on the one hand, and members of the World Business Council for Sustainable Development (WBCSD) and its Climate Smart Agriculture initiative, on the other.

This suggests a largely market-based approach to CSA and the distribution of benefits, and also an implicit focus on farmers’ practices as part of the problem rather than the solution. The literature suggests that linking farmers to markets is a common approach to mainstream CSA across economically marginal localities. As explained in relation to a cocoa certification program under a CSA label in Ghana: “The goal was to create a sustainable landscape that harnessed the transformative power of markets” (Noponen et al., 2014: 60). From this perspective, CSA’s job is to ‘create’ and ‘expand’ markets for small-scale farmers to benefit, initiate public-private partnerships, and to align producers and buyers. However, the ability of farmers to benefit from these markets relies on a number of other, pre-existing structures that are rarely fully acknowledged in this narrative. The promotion of industrial agricultural practices among smallholders’ integration in agricultural markets will often be structured along class, caste and gender lines. Markets are not merely open spaces where all entrepreneurial-minded people can improve their livelihoods. Rather, pre-existing social hierarchies are played out within markets, allowing some people improvement and further impoverishing others (Sugden, 2009). Without particular attention to these constraints, it is therefore highly doubtful whether and how CSA efforts will address structural inequities. From a *distributional equity* perspective, we argue that it is not inevitable that this CSA discourse help all farmers equally gain access to new markets; on the contrary, it can serve to further alienate them from new innovations.

¹³ See http://yara.com/sustainability/climate_smart_agriculture/, <http://monsantoblog.com/tag/climate-smart-agriculture/>, <http://www4.syngenta.com/site-services/our-stories/climate-smart-soils> (accessed 25th May 2017)

¹⁴ See <http://www.walmartsustainabilityhub.com/project-gigaton/agriculture>, https://www.kelloggcompany.com/content/dam/kelloggcompanyus/corporate_responsibility/pdf/2015/ClimatePolicyFINALDecember15-2015.pdf (accessed 25th May 2017)

¹⁵ <http://news.mcdonalds.com/Corporate/news-stories/McDonald%E2%80%99s-CEO-to-Speak-at-United-Nations-Climate> (accessed 25th May 2017)

Why has this growth-focused discourse attracted such interest from international public and global private-sector actors? The core policy message behind it appears to reinforce a widely held view that liberalised agricultural economy and vertically-integrated market arrangements can result in broader gains that ‘trickle down’ to the wider economy, with spin-offs to the rural non-farm sector. In time, the argument goes, this will result in a transition from a broadly subsistence-based agricultural economy to one which can afford more inputs and become more commercial, specialising along the way – if directed by demand – into high-value niche commodities and global markets. As the sector’s fortunes improve, the opportunities for exit from agriculture will increase as off-farm opportunities grow (e.g. in farm labour, agro-processing and the rural service sector). Such growth will create an economic ‘pull’ – rather than the current situation of being pushed out from a failing agriculture. The end result, its proponents assert, will be a vibrant, fully modernised integrated economy, with a small but efficient agricultural sector continuing to generate growth and employment.

Spearheading this process is the Global Alliance for Climate-Smart Agriculture (GACSA), an alliance between the private (mainly agro-industrial) sector, FAO, the World Bank, national governments and a number of civil society organizations¹⁶. GACSA was formed in 2014 and works to stimulate governments and other institutional bodies to operationalize and scale up CSA practices through the promotion knowledge, research and development in technology, practice and policy; fostering technology transfer, information sharing and technical assistance; improving effectiveness of public and private investments; and integrating CSA into policy and planning at all levels. With members including International Agri-Food Network, International Fertilizer Industry Association (IFA), WBCSD and Yara International, GACSA is heavily influenced by corporate interests. GACSA works, in short, to spread CSA, while also promoting its members’ standardised, agro-industrial packages and products and displaying their corporate social responsibility commitments. However, the launch of the GACSA has refueled opposition by some civil society organizations critical of its vague governance structure, the tying of agriculture to carbon markets and large-scale agro-industry, and the power of corporate members to drive and profit from CSA objectives (Anderson, 2014; Via Campesina, 2014). From a *procedural* equity perspective, it is thus clear that CSA’s orientation towards agro-industry serves to exclude the vast majority of small-holder farmers and can potentially undermine control over their lands as pressure increases to ‘be efficient’. Arguably therefore, GACSA fuels such exclusions precisely because of the kind of ‘climate smart’ activities this discourse of CSA imagines.

Fundamentally these mechanisms assume that the problem within agriculture is low growth and lack of access to markets. This framing of the problem means proposed interventions are both technical and economic in nature, focusing on transfer of ‘scale-neutral’ technologies, such as mitigation through carbon sequestration and capture and use of agro-chemicals – provided, of course, by agro-industrial companies, and production of a commodities for global markets that meet international grades and standards. A key dimension of this discourse is that increased investment must go towards modernising smallholder agriculture and integrating producers into vertically-integrated value chains. Critics assert that this narrow, market-oriented discourse masks important power asymmetries between the ‘partners’ and does not pay enough attention to important social justice and rights, particularly for women and marginalised groups. From a *recognition* equity perspective, this discourse thus reinforces that there are still a need to highlight and reiterate the need to move beyond ‘one-size-fits-all’ models and frameworks and develop a range of mechanisms that recognise the diversity of rural producers and agri-food systems if access to and control over the benefits of CSA interventions are to be shared equitably.

4.4 Community-based and agroecology perspectives on CSA

A fourth discourse is centred on opposition to CSA in relation to the roles and needs of smallholder farmers. While arguably all the previous discourses include attention to smallholders, this discourse

¹⁶ As of April 2017, GACSA had 162 members, see <http://www.fao.org/gacsa/members/members-list/en/> (accessed 25th May 2017)

differs in paying primary attention to the importance of starting from smallholders' knowledge and practices, and a strong link to agroecology-based farming¹⁷. As mentioned above, one of the core elements of the opposition to CSA, particularly among NGOs and civil society actors, is the view that CSA is incompatible with principles of agro-ecological farming principles. This formed a key argument for international and national level civil society organisations' rejection of CSA ahead of COP21¹⁸. Organisations such as the Institute for Agriculture and Trade Policy (IATP) have been vocal critics of CSA on this basis.¹⁹ There are nuances to this picture, however, in that some NGOs are engaging with CSA focused on smallholder agriculture, with their framing of CSA often linked to agroecology principles. An example is NGO support for the Africa CSA Alliance (ACSAA), convened by NEPAD's CAADP programme, which includes CARE International, Concern, Catholic Relief Services (CRS), Oxfam and World Vision.

According to this narrative, the way CSA is conceived and promoted, and ultimately the agenda of the dominant actors behind the discourse, are fundamentally in conflict with agroecology-based agricultural approaches. Key aspects here are the link to global carbon markets in CSA principles and practices and the emphasis on techno-managerial solutions in CSA implementation. Ultimately, this discourse considers CSA as insufficient because of its lack of attention to root causes of vulnerabilities and inequities, missing attention to the transformative changes that will be needed to tackle climate change and agriculture challenges. A different perspective on this also exists, however, expressed through the argument by Altieri and Nicholls (2013) that there are opportunities for smallholder-based CSA based on traditional knowledge and practices, that can at the same time distance themselves from the dependence on agro-chemicals and carbon market-based solutions.

From a *distributive* equity perspective, the primary focus is on benefits to poor and marginalised smallholder farmers over other actors. This discourse criticises CSA as ultimately reinforcing and cementing current inequities, and further marginalising the poorest and most vulnerable. The argument is that CSA cannot succeed without a strong focus on equity (e.g. Rawe et al., 2015). One body of literature argues that to improve food security, CSA needs to prioritize the design and application of adaptation to enable farmers to learn to cope with a warmer and more volatile climate (see e.g. Timmer, 2013; Shea, 2014). Such practices include increasing soil water-holding capacity, engaging in conservation tillage, planting cover crops, and diversifying cropping systems. These practices are distinct from productivity-led and efficiency mechanisms in that they focus on the use of agricultural inputs like water and soil, rather than production outputs. Not doing so, it is argued, will threaten longer-term goals of food security. Studies of equity have shown conclusively that new technologies tend to be taken up by more powerful local actors, serving to further reinforce local hierarchies (Peterman et al. 2014). Therefore, CSA on its own cannot overcome problems of access to and control over new technologies intended to promote production and adaptation.

Similarly, *procedural* equity arguments are central to this discourse of CSA, focusing on farmers' participation in bringing their concerns and knowledge to bear on discussions on what and who CSA is for, and whose concerns it is addressing. The argument here is that without explicit consideration and participation of the poorest and most vulnerable groups, who are ultimately intended to benefit from climate funding, CSA is unlikely to help address the structural constraints to farmers' participation. Thus, if procedural equity goals are to be achieved, the focus needs to be on root causes and constraints; i.e. asking *why* farmers are vulnerable rather than limiting the assessment to *who* and *what* are vulnerable (Ribot, 2014).

From a *recognition* perspective, there is a strong focus on the diverse contexts of farmers' livelihoods and knowledge in this discourse (Millstone et al., 2009). A counter CSA discourse therefore ultimately requires embracing and harnessing indigenous knowledge (Domfeh 2015), and focusing on

¹⁷ Agroecology is a principle for sustainable agriculture based on applying ecological principles to agricultural production systems, as well as minimising external inputs.

¹⁸ See e.g. list at <http://www.climatesmartagconcerns.info/cop21-statement.html>

¹⁹ See <https://www.iatp.org/blog/201410/climate-smart-agriculture-isn%E2%80%99t-agroecology-is>

existing practices, rather than only relying on new and ‘external’ technology. In Nepal, the project we visited was still in the early stages of implementation, but we were struck by the emphasis on market integration and new agricultural technologies as opposed to fostering traditional agricultural products which the lead NGO’s other programs champion.

Recognition of diverse forms of property rights also plays a key role here. Scherr et al. (2012:6) assert that clearly defined ownership rights are “critical for successful, long-term management. Secure tenure allows land managers to look towards a future where they can build profitable, climate-resilient systems (...)”, and that insecure property rights “pose a barrier to adoption of climate-smart practices, as there is little incentive to invest time and money to transition management practices”. Actors advocating for efficient resource management thus tend to argue that the lack of clearly demarcated ownership rights on common and customary property resources impede the progress towards CSA, as it is easier to manage resources with clearly defined boundaries and usufruct rights. As Rajasekhar et al. (2012) argue in relation to south India, contesting claims on land ownership surrounding common property resources ‘leads to the preference to take up works not relating to natural resource management and assigning higher priority to private lands having clear-cut property rights. While the former impedes the progress towards climate-smart agriculture, the latter makes it less inclusive.’ (p.16). The argument is that CSA is thus often used as an excuse for regularizing property rights in places where access to collective lands is vital for the poorest of the poor. Once again, the literature on property rights suggests that equity dilemmas are not solved by tenure rights efforts alone (Peters 2009). Rather, the complexities of overlapping tenure claims, national versus local understandings of tenure and intra-household access issues raise equally complex equity questions (Peluso and Lund 2011). Thus, while certainly debated, the assigning of tenure in itself does not solve problems of uneven access to resources and benefits (Larson et. al. 2013).

Despite nuances as mentioned above, this fourth discourse can in many ways be seen as a counter-narrative to the three other, dominant narratives of CSA on the global scale. Standard frameworks of market-based, and techno-centric solutions for addressing food security and poverty problems are dominant on larger scales, while agroecology, organic agriculture, and permaculture struggle to find space. Given the equity concerns the former three discourses raise, questions remain over to what extent CSA activities will be able to overcome the structural inequalities that shape access to and control over resources, whether those are financial resource, new technologies or land.

5 Conclusions

The aim of this paper has been to unpack questions of control over and equitable access to resources implied by key discourses surrounding climate-smart agriculture. Discourses matter because they exert power over how issues are framed, and ultimately which activities are prioritised and funded. With its broad definition, CSA allows a set of widely different practices, and as a result, has come under intense scrutiny and criticism. One of the key areas of contention is its implications for social equity. CSA is aiming to improve adaptation, mitigation and food security, but will affect different groups in different ways, will involve winners and losers, and trade-offs between goals. However, equity is rarely defined in the CSA literature, and the broad definition of CSA, notably from the FAO, provides little guidance for addressing fundamental concerns of control over and access to changing resources.

The paper addressed these gaps by using a Rawlsian-inspired equity framework to unpack four key CSA discourses: climate mitigation policy goals, agricultural development and transformation, agribusiness, and finally, smallholder and community-based CSA. Some of these dimensions are articulated in CSA discourses, e.g. around participation and benefits, but many remain implicit in the CSA literature, which the analysis sought to bring out.

We argue that an equity perspective on CSA discourses is useful for political as well as instrumental reasons. Our contention is that these four different discourses or ‘versions’ of CSA, have different implications for long term control over and access to resources by different groups of farmers, raising

questions and concerns as summarised in Table 1 below. None of the discourses fully addresses the concerns raised. Rather, they are entrenched within existing paradigms and practices, and are likely to reproduce and exacerbate existing inequalities rather than challenge them.

[TABLE 1 HERE]

Despite differences between the four discourses, some broad patterns can be drawn out. Common to the first three (climate policy, agricultural transformation, agro-industry) are a strong focus on efficiency-based distributive equity, while the last (smallholder CSA) tends to focus more on needs-based distributive equity. In all four discourses, there are efforts to increase participation of vulnerable and marginalised groups, but with arguably less attention to this in agribusiness-related discourses, which focuses on participation in markets—which has been shown to be shaped by pre-existing inequalities. In terms of contextual equity, with a few exceptions the four discourses predominantly assume working within current institutional and political structures, with as yet very limited focus on transformational change to underlying structures with a goal to improve resource access.

In addition to providing a better understanding around the equity aspects of CSA, we argue that when equity questions guide an analysis of CSA, implications for policy and practice become clearer. Going back to the original conceptualisation of CSA, namely initiatives and activities that lead to *'triple wins'*, and linking this to an understanding of equity that focuses attention to distributional, procedural and contextual dimensions, the following concerns stand out. *First*, distributive equity implies a need to acknowledge how CSA may shift the responsibility for climate change mitigation from international and regional actors to national governments and NGOs and, in some cases, to those least able to respond to these expectations, poor local producers and resource managers. In terms of policy, this reinforces the need for national and international actors to be cautious about promoting CSA on the ground without addressing the global origins of climate change.

Second, on procedural justice grounds, while CSA is often portrayed as a force for transforming the agricultural sector, evidence suggests that it is unlikely to fundamentally shift power to address the key factors that constrain or block the emergence of more pro-poor agricultural development, adaptation to climate change, or carbon sequestration and storage. The dominant focus on market-based transformations, in particular, may lead to new risks and vulnerabilities, loss of control over resources, and entrench already unequal power structures. *Third*, and following from the above, to improve CSA outcomes, a focus on recognition equity means more attention needs to be given to the institutions that underpin the bargaining power of the poorest and most vulnerable groups. It is inadequate to simply make technologies available, as there are other social dimensions that block access to them for marginalized groups.

In conclusion, new governance architectures are required if CSA is to be pursued in ways that are just, socially inclusive and respectful of tradition and livelihood. Although organisations such as the FAO explicitly call for context-specific interventions and innovations, the operationalisation of CSA thus far draws heavily on conventional, top-down, technical solutions to achieve impact at scale. GACSA, for example, aims at enabling 500 million farmers to practice CSA by 2030. How to achieve that goal and at the same time take local socio-political contexts and agro-ecological diversity into account is almost impossible to imagine. Our analysis suggests that CSA is frequently framed as a global problem, stimulating actors to find global solutions that are easily traded. While practices such as agro-ecology and permaculture are inherently local but not easily exported, technological interventions are global in reach but are less sensitive to local socio-ecological particularities, including equity concerns, and hence risk exacerbating food insecurity and inequality. Our analysis thus points to the need for better recognition of the political nature of discourses like CSA and the highly differential impacts they can have on control over and access to changing resources on the ground.

6. References

- Adekola, O. and F. Terdoo. 2014. Assessing the role of climate-smart agriculture in combating climate change, desertification and improving rural livelihood in Northern Nigeria. *African Journal of Agricultural Research* 9 (15): 1180-1191.
- Adger, W.N., Paavola, J., Huq, S., Mace, M.J. (Eds.). 2006. *Fairness in Adaptation to Climate Change*. MIT Press, Cambridge.
- Agarwal, A., Narain, S. 1991. *Global Warming in An Unequal World*. Centre for Science and Environment, New Delhi
- Altieri, M. A., and C.I. Nicholls. 2013. The adaptation and mitigation potential of traditional agriculture in a changing climate. *Climatic Change* 140 (1): 33-45.
- Anderson, T. 2014. *Clever Name, Losing Game? How Climate Smart Agriculture is sowing confusion in the food movement*, ActionAid International.
- Atela, J. 2012. *The politics of Agricultural carbon finance: The case of the Kenya Agricultural Carbon Project*. STEPS Centre Working Paper. Brighton, UK: University of Sussex.
- Azar, C., Rodhe, H. 1997. Targets for stabilization of atmospheric CO₂. *Science* 276, 1818–1819.
- Berazneva, J. and D.R. Lee. 2013. Explaining the African food riots of 2007–2008: An empirical analysis. *Food Policy* 39: 28–39.
- Bernier, Q., Franks, P., Kristjanson, P., Neufeldt, H., Otzelberger, A., and Foster, K. 2013. *Addressing Gender in Climate-Smart Smallholder Agriculture*. ICRAF Policy Brief 14. Nairobi: World Agroforestry Centre.
- Burch, D., Lawrence, G., Green, G. P., Ichijo, K., Nonaka, I., Pimentel, M., ... and M. J. Carneiro. 2007. *World Development Report 2008: agriculture for development* (No. E14 231). The World Bank.
- Campbell, B. M., Thornton, P., Zougmore, R., Van Asten, P., & Lipper, L. 2014. Sustainable intensification: What is its role in climate smart agriculture? *Current Opinion in Environmental Sustainability* 8: 39-43.
- Campbell, B. M., Vermeulen, S. J., Aggarwal, P. K., Corner-Dolloff, C., Girvetz, E., Loboguerrero, A. M., ... & E. Wollenberg. 2016. Reducing risks to food security from climate change. *Global Food Security* 11: 34-43.
- Campbell, B., Thornton, P., Zougmore, R., van Asten, P. and Lipper, L. 2014. Sustainable Intensification: What is its Role in Climate Smart Agriculture? *Current Opinion in Environmental Sustainability* 2014 (8): 39–43.
- Caron, P., and S. Treyer. 2016. Climate-Smart Agriculture and International Climate Change Negotiation Forums. pp 325-336 in Torquebiau, E. (ed.) 2016. *Climate Change and Agriculture Worldwide* (pp. 325-336). Netherlands: Springer.
- Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., & Mitchell, R. B. 2003. Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences* 100 (14): 8086-8091.
- Chandra, A., McNamara, K., and Dargusch, P. 2017, in press. Climate-smart agriculture: Perspectives and framings. *Climate Policy*
- Chinsinga, B., Chasukwa, M., and L. O. Naess. 2012. *Climate change and agricultural policy processes in Malawi*. Working Paper 046. Future Agricultures. Brighton, UK: Institute of Development Studies (IDS).
- Delvaux, F. [et al.] 2014. ‘Climate-Smart Agriculture’: the Emperor’s new clothes? *CIDSE Discussion Paper*.
- Domfeh, K. A. 2015. Indigenous knowledge key in promoting climate smart agriculture. Climate and Development Knowledge Network (CDKN) Online: https://cdkn.org/2015/05/indigenous_knowledge_key_-_climate_smart_agriculture/?loclang=en_gb
- Eriksen, S., Nightingale, A., and Eakin, H. 2015. Reframing Adaptation: The Political Nature of Climate Change Adaptation. *Global Environmental Change* 35: 523–533.
- FAO. 2009. *How to Feed the World in 2050*. High-Level Expert Forum. FAO, Rome.
- FAO. 2013. *Climate-smart agriculture sourcebook*. Rome: Food and Agriculture Organization of the United Nations.

- FAO. 2014. *FAO Success Stories on Climate-Smart Agriculture*. Rome: Food and Agriculture Organization of the United Nations.
- FAO. 2010. *Climate-Smart Agriculture: Policies, Practices and Financing for Food Security, Adaptation and Mitigation*. Rome: Food and Agriculture Organization of the United Nations.
- FAO. 2016. *State of Food and Agriculture 2016: Climate Change, Agriculture and Food Security*. Rome: Food and Agriculture Organization of the United Nations.
- Fischer, F. 2003. *Reframing public policy: discursive politics and deliberative practices*. Oxford: Oxford University Press
- Foucault, M. 2003. *Society must be defended: Lectures at the College De France, 1975–76*, trans. David Macey. New York: Picador.
- Fraser, N. 2008. *Scales of justice: reimagining political space in a globalizing world*. Cambridge.
- Forsyth, T. 2014. Climate justice is not just ice. *Geoforum* 54 (0): 230-232.
- Garrity, D.P., Akinnifesi, F.K., Ajayi, O.C., Weldesemayat, S.G., Mowo, J.G., Kalinganire, A., Larwanou, M. and Bayala, J. (2010) Evergreen Agriculture: a robust approach to sustainable food security in Africa. *Food Security* 2 (3): 197–214.
- Gattinger, A., Muller, A., Haeni, M., Skinner, C., Fliessbach, A., Buchmann, N., ... & Niggli, U. 2012. Enhanced top soil carbon stocks under organic farming. *Proceedings of the National Academy of Sciences* 109 (44): 18226-18231.
- Hedger, M. 2011. *Agriculture and climate change in the UN climate negotiations*. Future Agricultures Policy Brief 43. IDS, Brighton, UK.
- Hossain, N., Brito, L., Jahan, F., Joshi, A., Nyamu-Musembi, C., Patnaik, B., Sambo, M., Shankland, A., Scott-Villiers, P., Sinha, D., Kalita, D. and Benequista, N. (2014) 'Them Belly Full (But We Hungry)': *Food rights struggles in Bangladesh, India, Kenya and Mozambique*. Synthesis report from DFID-ESRC research project 'Food Riots and Food Rights'. Brighton: Institute of Development Studies.
- Hyder, T.O., 1992. Climate negotiations: the north/south perspective. In: Mintzer, I.M. (Ed.), *Confronting Climate Change: Risks, Implication and Responses*. Cambridge University Press, Cambridge, pp. 323–336.
- IFAD. 2011. *Climate-Smart Smallholder Agriculture: What's Different?* IFAD Occasional Paper 3. Rome: IFAD.
- ISA. 2014. *Scientists' support letter for the International Symposium on Agroecology*, Sept. 2014. FAO International Symposium on Agroecology for Food Security and Nutrition, 18-19 September 2014. Rome: FAO.
- Jekwu Ikeme 2003. Equity, environmental justice and sustainability: incomplete approaches in climate change politics, *Global Environmental Change*, 13(3)
- Jordan, A., Wurzel, R. K., & Zito, A. R. 2013. Still the century of 'new' environmental policy instruments? Exploring patterns of innovation and continuity. *Environmental Politics* 22 (1): 155-173.
- Kandlikar, M., Sagar, A., 1999. Climate change research and analysis in India: an integrated assessment of a south-north divide. *Global Environmental Change* 9 (2): 119-138.
- Keeley, J. and I. Scoones. 2003. *Understanding environmental policy processes : cases from Africa*. London, Sterling, VA, Earthscan.
- Kimaro, A., Mpanda, M., Rioux, J., Aynekulu, E., Shaba, S., Thiong'o, M., Mutuo, P., Abwanda, S., Shepherd, S., Neufeldt, H. and Rosenstock, T. 2016. Is Conservation Agriculture 'Climate-Smart' for Maize Farmers in the Highlands of Tanzania? *Nutrient Cycling in Agroecosystems* 105 (3): 217–228.
- Larson, A. M., Brockhaus, M., Sunderlin, W. D., Duchelle, A., Babon, A., Dokken, T., . . . Huynh, T.-B. 2013. Land tenure and REDD+: The good, the bad and the ugly. *Global Environmental Change* 23 (3): 678-689.
- Leach, M., Scoones, I., & Stirling, A. 2010. *Dynamic sustainabilities: technology, environment, social justice*. London: Earthscan.
- Levy, B. S., & Patz, J. A. 2015. Climate change, human rights, and social justice. *Annals of global health*, 81 (3): 310-322.
- Lipper, L., Thornton, P., Campbell, B.M., Baedeker, T., Braimoh, A., Bwalya, M., Caron, P., Cattaneo, A., Garrity, D., Henry, K., Hottle, R., Jackson, L., Jarvis, A., Kossam, F., Mann,

- W., McCarthy, N., Meybeck, A., Neufeldt, H., Remington, T., Thi Sen, P., Sessa, R., Shula, R., Tibu A. and Torquebiau, E. 2014. *Nature Climate Change* 4: 1068–1072.
- Lipton, M. 2005. *Crop Science, Poverty and the Family Farm in a Globalising World*. IFPRI 2020 Discussion Paper. Washington, DC: International Food Policy Research Institute.
- Loos, J., Abson, D., Jahi Chappell, M., Hanspach, J., Mikulcak, F., Tichit, M. and Fischer, J. 2014. Putting Meaning Back Into ‘Sustainable Intensification’. *Frontiers in Ecology and Environment* 12 (6): 356–361.
- Mann, W., Lipper, L., Tennigkeit, T., McCarthy, N., Branca, G. and Paustian, K. 2009. Food Security and Agricultural Mitigation in Developing Countries: Options for Capturing Synergies. Rome: FAO.
- McDermott, M., Mahanty, S. and Schreckenberg, K. 2013. Examining Equity: A Multidimensional Framework for Assessing Equity in Payments for Ecosystem Services. *Environmental Science and Policy* 33: 416-427.
- Millstone, E., Thompson, J., & Brooks, S. 2009. *Reforming the global food and agriculture system: Towards a questioning agenda for the new manifesto*. Brighton, STEPS Centre, IDS and the University of Sussex, Brighton.
- Murray, U., Zewdy, G., Brychkova, G., and Spillane, C. 2016. Smallholder Farmers and Climate Smart Agriculture: Technology and Labor-productivity Constraints amongst Women Smallholders in Malawi. *Gender, Technology and Development* 20 (2): 1–32.
- Neate P.J.H. 2013. *Climate-smart agriculture success stories from farming communities around the world*. Wageningen, Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and the Technical Centre for Agricultural and Rural Cooperation (CTA).
- Neufeldt, H., Jahn, M., Campbell, B.M., Beddington, J.R., DeClerck, F., De Pinto, A., Gullidge, J., Hellin, J., Herrero, M., Jarvis, A. and LeZaks, D. 2013. Beyond climate-smart agriculture: toward safe operating spaces for global food systems. *Agriculture & Food Security* 2 (1): 12
- Nightingale, A. 2003. Nature–society and development: social, cultural and ecological change in Nepal. *Geoforum*, 34 (4): 525-540.
- Nightingale, A. J. 2005. 'The experts taught us all we know': Professionalisation and Knowledge in Nepalese Community Forestry. *Antipode*, 34 (3): 581-604.
- Nightingale, A. J. 2015. A Socionature Approach to Adaptation: Political transition, intersectionality, and climate change programmes in Nepal. Pp 219-234 in T. H. Inderberg, S. Eriksen, K. O’Brien and L. Sygna (eds.) *Climate Change Adaptation and Development: Transforming Paradigms and Practices*, London: Routledge.
- Noponen, M., et al. 2014. A landscape approach to climate-smart agriculture in Ghana. *ETFRN News* 56.
- Nyasimi et al. 2014. Evidence of Impact: *Climate-smart agriculture in Africa*. CCAFS Working paper no. 86, Copenhagen, Denmark
- Ojha, H. R., Ghimire, S., Pain, A., Nightingale, A., Khatri, D. B., & Dhungana, H. 2015. Policy without politics: technocratic control of climate change adaptation policy making in Nepal. *Climate Policy*, 16 (4): 415-433.
- Ostrom, E. 1990. *Governing the Commons. The evolution of institutions for collective action*. Cambridge: Cambridge University Press.
- Pearce, F. 2011. Can ‘climate-smart’ agriculture help both Africa and the planet. *Yale Environment*, 360.
- Pelling, M. 2011. *Adaptation to Climate Change: From Resilience to Transformation*. London: Routledge.
- Peluso, N. L., & Lund, C. 2011. New frontiers of land control: Introduction. *Journal of Peasant Studies*, 38 (4): 667-681.
- Peterman, A., Behrman, J. A., & Quisumbing, A. R. 2014. A Review of Empirical Evidence on Gender Differences in Nonland Agricultural Inputs, Technology, and Services in Developing Countries. In A. R. Quisumbing, R. Meinzen-Dick, T. L. Raney, A. Croppenstedt, J. A. Behrman, & A. Peterman (Eds.), *Gender in Agriculture: Closing the Knowledge Gap* (pp. 145-186). Dordrecht: Springer Netherlands.

- Peters, P. 2009. Challenges in land tenure and land reform in Africa: Anthropological contributions. *World Development*, 37 (8): 1317-1325.
- Rawe, T., Deering, K., Echols, W., Nierenberg, D., Nink, E., Ahern, C., & Small, S. 2015. *Cultivating equality: delivering just and sustainable food systems in a changing climate*. CARE, CCAFS, FoodTank.
- Rawls, J., 1972. *A theory of Justice*. Harvard University Press, Cambridge, MA
- Rosenstock TS, Lamanna C, Chesterman S, Bell P, Arslan A, Richards M, Rioux J, Akinleye AO, Champalle C, Cheng Z, Corner-Dolloff C, Dohn J, English W, Eyrich AS, Girvetz EH, Kerr A, Lizarazo M, Madalinska A, McFatrige S, Morris KS, Namoi N, Poultouchidou N, Ravina da Silva M, Rayess S, Ström H, Tully KL, Zhou W. 2016. *The scientific basis of climate-smart agriculture: A systematic review protocol*. CCAFS Working Paper no. 138. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)
- Scherr, S. J., Shames, S., & Friedman, R. 2012. From climate-smart agriculture to climate-smart landscapes. *Agriculture & Food Security*, 1 (1): 1.
- Schreckenberk, K., Franks, P., Martin, A. and Langrk, B. 2016. Unpacking Equity for Protected Area Conservation. *Parks: The International Journal of Protected Areas and Conservation* 22 (2): 11-26.
- Simpson, L. 2012. Promoting Climate Smart Agriculture for Food Security in the Caribbean. *50/50 Conference on Globalization, Climate Change and Rural Resilience*.
- Smith, P. and J.E. Olesen. 2010. Synergies between the mitigation of, and adaptation to, climate change in agriculture. *The Journal of Agricultural Science* 148 (05): 543-552.
- Society, R. 2009. Reaping the benefits: science and the sustainable intensification of global agriculture T. R. Society. London.
- Stabinsky, D. 2014. *Climate-Smart Agriculture: myths and problems*. Heinrich-Böll-Stiftung.
- Sugden, F. (2009). Neo-liberalism, markets and class structures on the Nepali lowlands: The political economy of agrarian change. *Geoforum*, 40 (4): 634-644.
- Sumberg, J. and J. Thompson 2012. *Contested Agronomy: Agricultural Research in a Changing World*. London: Routledge.
- Sumberg, J., Irving, R., Adams, E. and Thompson, J. 2012. Success-Making and Success Stories: Agronomic Research in the Spotlight. Pp 186-203 in Sumberg, J. and Thompson, J. (eds) *Contested Agronomy: Agricultural Research in a Changing World*. London: Earthscan.
- Sumberg, J., Thompson, J. and Woodhouse, J. (2013). Why Agronomy in the Developing World Has Become Contentious. *Agriculture and Human Values* 30(1): 71–83.
- Suppan, S. and Sharma, S. 2011. Elusive promises of the Kenya agricultural carbon project. Institute for Agriculture and Trade Policy, South Minneapolis, Minnesota, USA.
- Tanner, T. and J. Allouche 2011. Towards a New Political Economy of Climate Change and Development. *IDS Bulletin* 42 (3): 1-14.
- Taylor, M. (2015). *The Political Ecology of Climate Change Adaptation: Livelihoods, Agrarian Change and the Conflicts of Development*. London: Routledge.
- Taylor, M. 2017, Forthcoming. Climate Smart Agriculture: What is it Good For? *Journal of Peasant Studies*.
- Thompson, J. and Scoones, I. 2009. Addressing the Dynamics of Agri-Food Systems: An Emerging Agenda for Social Science Research. *Environmental Science and Policy* 12 (4): 386–397.
- Tol, R.S.J., 1999. Spatial and temporal efficiency in climate change: applications of fund. *Environmental Resource Economics* 14: 33–49.
- Vermeulen, S. 2015. Closing the gender gap in climate-smart agriculture: A brief review of recent approaches relevant to CSA programs. CCAFS Info Note. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).
- Via Campesina. 2014. *UN-masking Climate Smart Agriculture*. Online: <https://viacampesina.org/en/index.php/main-issues-mainmenu-27/sustainable-peasants-agriculture-mainmenu-42/1670-un-masking-climate-smart-agriculture> (accessed 12 December 2016)
- Wigley, T.M.L., Richels, R.G., Edmonds, J.A. 1996. Economic and Environmental Choices in the stabilization of atmospheric CO₂ concentrations. *Nature* 379: 240–243.

- Woelcke, J. 2012. *More Than Just Hot Air: Carbon Market Access and Climate-Smart Agriculture for Smallholder Farmers*. Smart Lessons: Real experiences, Real Development. W. B. G. International Finance Corporation.
- World Bank. 2011. *Climate-Smart Agriculture: A Call to Action*. World Bank, Washington.
- World Bank, FAO, and IFAD. 2015. *Gender in climate-smart agriculture: Module 18 for gender in agriculture sourcebook*. Agriculture global practice. Washington, D.C.: World Bank Group.

Acknowledgements

An earlier version of the paper was published as CCAFS Working Paper 197 (2017), and a draft was presented at the conference “Contested Agronomies”, held at IDS, Brighton, UK, 23-26 February 2016. We would like to thank for all comments and suggestions received from CCAFS and their partners, as well as six anonymous reviewers. Remaining errors and omissions are the responsibility of the authors.

Funding

The authors are grateful for financial support for this study from the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Naess and Thompson would like to acknowledge additional support from the Sussex Sustainability Research Programme (SSRP).