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Climate-smart agriculture: what is it good for?

Marcus Taylor

Leading international organisations presently argue that a transition to ‘climate-smart agriculture’ (CSA) is an obligatory task to ensure food supply for an anticipated nine billion people by 2050. Despite the rubric’s newfound importance, the conceptual underpinnings of CSA are often left unclear. Focusing on the World Bank’s framework, this paper critically interrogates the principles and concepts that underpin CSA. It argues that while CSA provides greater policy space for more holistic approaches to agriculture, it nonetheless operates within an apolitical framework that is narrowly focused on technical fixes at the level of production. This depoliticised approach to the global food system tends to validate existing policy agendas and minimise questions concerning power, inequality and access. By highlighting four strong tensions that permeate the CSA framework, the paper extols the need to greatly widen the scope of debate. To this end, it proposes an alternative ‘climate-wise’ framework to foreground the inherently political dimensions of food and agriculture in an era of climatic change.

Keywords: climate change; climate-smart agriculture; world bank; agriculture; global food system; resilience; sustainability; agroecology

Flip through the opening pages of almost any institutional publication on the future of agriculture and a common scenario unfolds. The initial paragraphs chart how an inexorable rise in population is envisaged to join in a deadly embrace with climate change to pose substantial challenges to global food security over the coming decades. Without a pronounced transformation of agriculture, it is recurrently argued, humanity will quite simply struggle to put enough food on the plates of a projected nine billion people by 2050 (World Bank 2011a, 2015b, 2015c; FAO 2013). To respond to this projected Malthusian crisis, international institutions from the World Bank to the Food and Agriculture Organization (FAO) have lauded a global transition to ‘climate-smart agriculture’ (CSA). The latter comprises a unified governance framework designed to diffuse agricultural methods and technologies that increase the productivity of a given crop while simultaneously building resilience to climate change and reducing greenhouse gas emissions. It is this ‘triple-win’ approach – the incorporation of intensification, adaptation and mitigation goals into a single rubric – that defines CSA.

Powered by its intuitive call for change, CSA has rapidly become a key organising concept for international organisations working at the nexus of climate change, agriculture and development. Since first promoting the term in 2009, the World Bank has ascended to become the leading voice in the CSA choir. If suitably backed by an enabling governance framework, the Bank claims, the spread of CSA methods can facilitate a deep-seated

transformation of the global food system (World Bank 2015b, 13). To this end, the Bank is currently undertaking national-level CSA profiles to assess current levels of climate ‘smartness’ within developing world countries and to pinpoint areas where new investments need to occur. Simultaneously, it has lauded CSA as a pivotal mechanism for achieving the Sustainable Development Goals (SDGs); CSA figures prominently in the Bank’s ambitious *Africa Climate Business Plan* that projects a USD 15 billion decade-long programme of investment aimed at pronounced social and infrastructural transformation (World Bank 2015a).

Despite the rhetorical appeal of the ‘triple-win’ approach, however, not everyone is equally seduced. The emerging yet sparse academic literature on CSA has pointed to its inherent vagueness in which the lack of firm criteria leads to a rubric with ‘no specific direction, no new science agenda, no ability to negotiate and prioritize contentious and conflicting agendas and no compelling reason to increase or shift investment’ (Neufeldt et al. 2013, 3). Others have noted the lack of a firm participatory mandate within CSA that could give sufficient space for farmer-driven expertise and innovation (Whitfield 2015). In this vein, despite a wide range of proclaimed ‘success stories’ that the Bank collects under the auspices of CSA, key agrarian social movements have critiqued the framework. Most notably, the transnational agrarian movement *La Via Campesina* has decried CSA as a façade dominated by a corporate oligarchy under which a business-as-usual approach can proceed (Via Campesina 2015).

To contribute to the debate, this paper charts the emergence of CSA within the World Bank and scrutinises its conceptual foundations and underlying metrics.¹ Using a perspective rooted in the political ecology of agrarian change, the paper highlights a series of core tensions within the CSA approach. It demonstrates how CSA is framed in expressly apolitical terms that are restricted to the identification and generalisation of technical solutions to field-level problems posed by climate change impacts. As a consequence, while CSA duly increases policy space for the recognition and propagation of a more holistic range of agricultural practices, it does so in a way that marginalises the socio-political dimensions of food production and distribution. Put simply, CSA fails to address how enduring inequalities of access in both production and consumption strongly shape who is rendered vulnerable to climate change and who is left food insecure. At the same time, by refusing to integrate the analysis of production, distribution and consumption, the framework ignores how climate-smart production practices can be used to sustain climate-stupid consumption practices. In conclusion, the paper advocates the need to pursue an alternative ‘climate-wise’ framework that can better balance productivity questions with sustainability issues while engaging the power relations and extant inequalities that characterise the contemporary global food system.

Lineages of climate-smart agriculture

The rise of CSA has been nothing short of remarkable. In the space of just half a decade, it has transitioned from an outlier concept to a dominant institutional rubric for discussing

¹These include its initial 2011 *Call for action*; its May 2015 report, *Ending poverty and hunger by 2030: an agenda for the global food system*; and its follow-up October 2015 report, *Future of food: shaping a climate-smart global food system* (World Bank 2015b, 2015c). In addition, I draw upon the framing document for the *Africa Climate Business Plan* (World Bank 2015a), and the CGIAR’s related dossier on *Climate-smart success stories from around the world* (CGIAR 2013).

contemporary agricultural policy. This prominence is typically attributed to a growing recognition that climate change will tighten existing production constraints within agriculture, thus necessitating a paradigm shift. As the World Bank puts it:

With yields flattening, the demand for animal protein growing, the population increasing and incomes improving, and an increasing rate of land degradation, the headwinds against the food system reaching its critical goal are almost insurmountable. In the face of climate change and considering the negative impacts the food system currently has on the climate, there is no doubt that a new approach to managing the food system is desperately needed. (World Bank 2015c, 23)

Notwithstanding its clarion call for a new approach, the CSA framework retains key elements from established policy rubrics. In particular, the idea of win-win solutions has a long lineage within Bank thinking around agriculture and development. For the World Bank, this was set out most stridently in its landmark *World Development Report 2008: agriculture for development*. Although this document did not address climate change directly, it nonetheless insisted that a shift in production systems was pivotal to reduce the environmental footprint of agriculture and to make food provisioning less vulnerable to external shocks such as weather extremes. The primary culprit for existing environmental degradation, the Bank claimed, was poor governance. Trade barriers, input subsidies and national price supports, it argued, created market distortions that incentivised the cultivation of environmentally inefficient crops and the deployment of wasteful agricultural practices. If the right institutions could be put in place and suitable market opportunities provided, farmers would embrace technological innovations that could 'make agriculture more sustainable with minimum tradeoffs on growth and poverty reduction' (World Bank 2007, 16). Without strong incentives towards agricultural intensification, however, agriculture was left with nowhere to go except outwards, leading to the spread of inefficient production onto marginal lands prone to degradation and susceptible to environmental shocks.

On this basis, the Bank argued that policy reforms that could more closely align farmer decisions with market imperatives offered the win-win prospect of combining increased efficiency with greater sustainability. Undistorted competitive pressures, it was envisaged, would guide farmers towards the use of modern agricultural technologies that induce greater yields from the same land and water resources. This in turn would slacken the pressure to extend cultivation onto fragile lands and provide the material foundations on which to transition populations out of agriculture into more productive economic sectors. So long as strict property rights were in place to apportion rewards and externalities to relevant actors, the combination of market facilitating governance structures and technological advances was argued to provide a mutually beneficial scenario of productivity enhancement, sustainability gains and economic growth (World Bank 2007, 187). Market liberalisation, in this view, provided a pathway towards sustainable economic growth whereas a failure to suitably modernise agriculture would lead to environmental degradation and the proliferation of poverty traps for rural households. Such an approach, of course, clashed strongly with an extensive body of literature within agrarian political economy that highlighted the deep social dislocations that the Bank's approach explicitly advanced.²

²See in particular the critiques of the Bank's 2008 *World Development Report* edited by Tania Murray Li in *The Journal of Peasant Studies* 36(3).

While it was politically expedient for the World Bank to subsume sustainability concerns under its longstanding policy prescription of liberalisation, climate change could not be so easily folded under this rubric. This is because the kinds of input-intensive industrial farming that the Bank advocated appeared to be both complicit in greenhouse gas emissions and vulnerable to climate shocks and stresses. As a result, the Bank began to talk of urgently ‘climate-proofing’ its development interventions in 2006, yet it struggled to incorporate a climate change strategy into its broader development philosophy (World Bank 2006). Notably, aside from a few scattered references, the 2008 *World Development Report* on agriculture remained far more concerned with investment climate than meteorology. This neglect, however, began to change following the 2007 Fourth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) that pinpointed the climate change threat to agricultural production and generated considerable urgency for the Bank to stake out a stronger framing position of its own (IPCC 2007).

In its search for a suitable rubric under which to draw together the various strands of its policy approach, the Bank turned to a familiar concept that emerged in a different wing of its activities. Since the mid-2000s the Bank had extensively advocated the idea of ‘smart economics’ as part of its *Gender Action Plan* (Chant 2012). The concept of gender-smart economics rests upon the premise that a range of social and cultural constraints prohibits women from playing a full role as workers, entrepreneurs and consumers within mainstream economic life. This discrimination is argued to have the dual effect of oppressing women while simultaneously depriving the economy of valuable human capital and resources, stifling aggregate growth. In response, targeted investments and institutional reforms to remove these barriers are labelled as ‘smart economics’ because they facilitate a simultaneous improvement of women’s welfare, gender equality and economic efficiency in a triple-win scenario (World Bank 2011b).

Although addressing a very different subject matter, smart economics encapsulates a number of key presuppositions that pass into CSA. First, ‘smart’ thinking is defined as the production of win–win outcomes in which all parties benefit. In the gender case, this emphasis on positive-sum games was tacitly justified in terms of political realism wherein the allure of improved aggregate growth is held out as the carrot to encourage reticent policymakers and private-sector agents to embrace reforms. ‘Smartness’ was thereby framed in terms of identifying policy routes that avoided difficult trade-offs by amalgamating potentially conflicting goals. Such a rhetorical strategy was undoubtedly one that appealed greatly to both governmental planners and corporate boardrooms. Second, the ‘gender-smart’ approach gravitated towards framing gender equality in instrumental terms as a means to improve global economic efficiency. Policy measures that prioritised equity over efficiency implied strong trade-offs and therefore could not be classified as ‘smart’. Instead, the approach supported policies predicated upon the improved integration of women within existing structures by either making them more attractive commodities on labour markets or by harnessing their entrepreneurial capacities as small business owners (Chant and Sweetman 2012; Elson 2012). On this basis, the prioritisation of win–win solutions precluded a more complex and historically grounded discussion of the relationship between power structures, socio-economic change and gender inequalities (Roberts and Soederberg 2012).

The ABCs of CSA

With the buzz about gender-smart economics reaching its zenith in the late 2000s, it is perhaps not surprising that the ‘smart’ prefix and its core prescription of win–win scenarios

would be incorporated into the realm of climate change. This first occurred in the Bank's *World Development Report 2010: development and climate change*, where the term 'climate-smart' was used to describe policies in any sphere that simultaneously enhance development, reduce vulnerability, and finance a transition to low-carbon growth (World Bank 2009). While the Bank referred tentatively to CSA in that report, it was the FAO that subsequently brought CSA into a more formal existence at its 2010 Conference on Agriculture, Food Security and Climate Change at the Hague (FAO 2010, 2013). For the FAO, CSA represented a natural extension to its existing 'sustainable intensification' approach tailored to the specific challenges posed by climatic change (Campbell et al. 2014; Loos et al. 2014). To this end, the FAO argued that it was imperative to integrate the 'triple-win' goals of sustainable intensification, resilience building and greenhouse gas mitigation into a livelihoods-orientated approach at a landscape level that could chart out the potential synergies latent within new production techniques. The sprawling 2013 *Climate-smart agriculture sourcebook* that the FAO subsequently produced sought to elaborate these principles over 18 detailed modules, covering topics from energy systems to soil conservation to fisheries development (FAO 2013).

At the same time as the FAO's Hague conference, the World Bank was actively expanding the rubric within its own policy agenda (World Bank 2011a). Over the subsequent half decade, the Bank has enshrined CSA as its key discourse for conceptualising the linkages between climate change, population growth, food security and agricultural production. With climatic impacts amplifying the pressures induced by population growth, the Bank cautions that conditions exist for a significant mismatch between food supply and demand in coming decades. In the absence of adaptations in the realm of production, the Bank starkly warns, the developing world will see notable detrimental impacts on food production, with the worst effects felt in Asia and Africa where yield declines may reach seven percent in key food-growing areas by 2030 (World Bank 2015c, 15). On this basis, finding ways to insulate agricultural intensification from climate change impacts through a transition to climate-smart practices that can safeguard future productivity gains appears to be a priority of compelling urgency. To this end, the Bank has pledged to make the entirety of its agricultural operations – from policy advocacy to active lending programmes – climate smart by 2019 (World Bank 2016).

Like the FAO, the World Bank is adamant that CSA should not be understood as a specific agricultural technology or practice. Rather, the Bank frames CSA as a governance framework to facilitate the adoption of improved techniques, methods and inputs at the level of production. CSA, it argues, is first and foremost a set of guiding norms that can be used to pinpoint successful models of agricultural production from among the heterogeneity of real-world practices. Any agricultural technique that – in comparison to standard existing practices – improves one of the triple-win aims can be designated climate smart. Those that improve multiple indices of smartness can be considered model practices that are most suited for emulation elsewhere. On this basis, CSA acts as an umbrella framework in which a diverse array of agricultural techniques that have advanced one or more of the 'triple-win' objectives can be identified, assessed and potentially scaled up or generalised across contexts.

Given the breadth of the underlying criteria, the practices usually identified under CSA are typically diverse and portray major contrasts in scale, objectives and outcomes (World Bank 2011a, 2015c). Some of the practices identified by CSA rubrics could be considered broadly agroecological in their orientation, such as water-harvesting projects in India and farmer-managed regeneration of trees within agricultural fields in the Sahel. It is undoubtedly positive to see these alternative forms of agriculture given due attention within official

rubrics that have typically focused on input-intensive and highly mechanised forms of cultivation. That said, conventional industrial agriculture techniques that advance one of the triple-win criteria are also lauded as CSA practices. On this basis, official documents routinely place small-scale conservation agriculture side by side with industrial-scale no-till canola monocropping predicated upon extensive glyphosate use as leading examples of CSA in practice (World Bank, 2011a; CGIAR 2013).

This eclecticism is formalised in the Bank's CSA Country Profiles. The latter systematically evaluate national agricultural practices to highlight which ones have moved in a 'climate-smart' direction and to identify where further progress can be achieved. Country by country, crop by crop, the profiles address the adaptation, mitigation and productivity dimensions of existing agricultural systems and rate each on a scale of 1 to 5 according to their degree of 'smartness' in usage of water, carbon, nitrogen, energy, weather and knowledge. A high score designates an improvement compared to previous agricultural techniques; a low score indicates a lack of progress. By taxonomising a broad spectrum of national agricultural technologies into a single list ranked according to their degree of transformation towards climate-smart goals, the World Bank anticipates that it can promote public and private investment into areas in which change is not proceeding fast enough while generating models of good practice for diffusion elsewhere. It is on this basis that CSA is being woven into both the normative goals and analytical metrics of contemporary development practice (World Bank 2015c, 23).

While the Bank presents CSA as prefiguring a transformation of agricultural production techniques on a global scale, it is clearly cognisant that it fits into a wider vision of agrarian change and food system dynamics. The World Bank's *Agriculture Action Plan 2013–15*, for instance, explicitly sets out that CSA must build on the priorities established in the 2008 *World Development Report* outlined above (World Bank 2013). Similarly, in its 2016 *Climate Action Plan*, the Bank further develops its priorities for technologically driven fixes. It commits to an agenda of developing climate-smart agriculture profiles and investment plans for at least 40 countries by 2020, while climate-smart agriculture programmes will be delivered at scale 'with a focus on hybrid seeds and carbon capture practices; high- efficiency/low-energy use irrigation programs; livestock productivity; energy solutions for agribusiness; and mainstreaming of risk management' (World Bank 2016).

Such an agenda for agriculture is a familiar one that reflects a longstanding prescription to make developing-world agriculture more intensive and efficient through technological advancement and integration into internationalised circuits of commodity exchange (Akram-Lodhi 2013). It is therefore little surprise that the rhetoric of CSA has received significant backing from the private sector, including the formation of a climate-smart agriculture working group chaired by PepsiCo, Monsanto, Olam and the Kellogg Company, and featuring key corporate interests from supermarket giant Walmart to agrochemicals firms such as Syngenta and Monsanto (World Business Council for Sustainable Development 2015). On this basis, CSA appears not to be an entry point through which to begin to reconceptualise the foundations of the global food system, but rather a technical supplement to an existing agenda. As encapsulated in the Bank's 2015 *Agenda for the Global Food System*, CSA's challenge of promoting triple-win solutions involves finding ways to link farmers more strongly into markets, promote the development of new biotechnologies suited to CSA goals, and mobilise public institutions to connect the two together (World Bank 2015b).

To be certain, the Bank clearly recognises that some agroecological methods may prove necessary elements of a more sustainable food system, particularly in parts of the

developing world where intensification has led to significant environmental degradation. This embrace of pluralism, however, does not stretch to incorporating the socio-political content of agroecology, still less the questions of power and inequality that animate agrarian political economy traditions (Gonzalez de Molina 2013; Gliessman 2013; see also Méndez, Bacon and Cohen 2015). CSA is steadfastly concerned with how food is produced, not who has access to land, water, labour and other inputs to produce it, nor how it is subsequently distributed and consumed. In focusing so intently on field-level technologies and practices, CSA isolates food production within an apolitical realm of managed fixes to technical problems in which the nature of external climatic challenges and demographic pressures determine the range and type of solutions possible. In so doing, the policy process is reduced to identifying 'smart' techniques, technologies and practices from among those that currently exist and subsequently generalising them among producers. The wider governance frameworks and underlying power relations that shape the production, distribution and consumption of food both in local contexts and internationally thereby remain unquestioned (cf. UNCTAD 2013).

Such continuity is greatly facilitated by a discursive technique that can be called the 'climatisation' of the development agenda (Taylor 2015). The latter is a process in which development challenges such as poverty and hunger are represented as being determined principally by the external influence of a malevolent climate. In its *Africa Climate Business Plan*, for example, the Bank argues that:

Climate is involved in most of the shocks that keep or push households into poverty. These shocks include natural disasters (such as loss of assets and disability after floods); health shocks (such as health expenditures and lost income as a result of malaria); and crop losses (as a result of drought or crop disease) and food price shocks. (World Bank 2015a, 3)

The troubling impacts of climate change shocks and stresses should not be doubted. Presenting climate as the primary author of development trajectories, however, follows a long-standing tradition in which environmental determinism is deployed to naturalise inequalities that have long and complex socio-historical causes (Fleming and Jankovic 2011; Hulme 2011). By ascribing poverty in sub-Saharan Africa to proximate environmental impacts, the Bank neatly sidesteps the thorny terrain that marks the political economy of development with its focus on local inequities of access to resources such as land, water and credit, through to the macro-level questions of enduring national indebtedness, oligopolistic market structures and the starkly uneven legacies of structural adjustment. On the contrary, the narrative of society adjusting to an external threat emanating from the natural world plays into a resolutely technocratic politics of 'resilience' defined loosely and opaquely (see Watts 2014; Taylor 2015).

Given the scale and pace of transformations experienced within many agro-environments, there is no doubt that new cultivation practices and appropriate technical advances are needed. In this respect, CSA's most important contribution is that it opens up further political space for the potential mainstreaming of innovative agroecological techniques into development practice. Yet, troublingly, it does so in a way that seeks to depoliticise the terrain of food production, distribution and consumption. There is no engagement with the core themes that animate the political economy of agrarian change, such as its close interrogation of the strongly differentiated impacts of technological change and commercialisation upon different social classes and genders. Nor is there a reckoning with the political ecology literature that explores how rural power relations drive processes of

environmental change while stratifying who is left vulnerable to their impacts.³ On the contrary, by maintaining a conspicuous silence on these issues, CSA seeks to occupy an apolitical terrain of providing technical solutions to natural problems. The attempt to exorcise the socio-political dimensions of food and agriculture from within its rubric, however, creates strong tensions throughout CSA's conceptual apparatus. I map out these tensions in four key stages, showing how the politics of food spills out of the conceptual packaging in which the Bank seeks to preserve it, creating both opportunities and dangers for those seeking a more transformative approach to the global food system.

Tension 1: the missing metrics

Based on its identification of climate-smart practices, the primary governance purpose of CSA is to act as a planning rubric that can help determine the most efficient investments for improving agricultural productivity under climatic shifts (World Bank 2015c, 6). As a result, the substance of CSA is strongly dependent on the metrics that underpin its triple-win scenarios. Strikingly, however, the Bank leaves these profoundly obscure. Despite over half a decade of publishing statement documents on CSA, no clear criteria are set out for CSA success. As a result, the conceptual frameworks that support key terms – including the axioms of productivity, resilience and mitigation – remain entirely implicit. Even where the Bank seeks to provide more precision, such as in its country CSA profiles, it fails to provide any clear criteria for its elaborate scoring system. Despite an extensive array of numerical ratings for different agricultural practices on a crop by crop basis, the Bank notes that its ratings are 'qualitative rankings' to assess 'positive change', without any formal methodology statement accompanying its documents.⁴ Indeed, the Bank emphasises that the country profiles do not include cost-benefit analysis or an assessment of barriers to the adoption of CSA practices and technologies, but merely offer 'a broad range of possibilities to potentially achieve the "triple win" within diverse farming systems and across socioeconomic settings and agroclimatic conditions' (World Bank 2015c, 15).

The failure to substantively ground CSA in a clearly articulated conceptual framework not only leaves the rubric opaque about how its key goals translate into practice, it also embeds sharp political tensions deep within the agenda. This is because the underlying concepts that hold together triple-win solutions can be defined in contrasting and potentially conflicting ways. Productivity, for example, can be measured through different criteria with distinct political implications and socio-ecological consequences. A smallholder using a significant proportion of household labour on limited land, for instance, is likely to value improving yield per hectare more than yield per labour hour. Conversely, a capitalist farm will value output per labour hour or unit of capital invested. In this respect, the call to increase productivity can, depending on the specific measure of productivity intended, embed distinct assumptions about the social character of agriculture within policy discourses and validate specific trajectories of agrarian change (see van der Ploeg 2014).

These tensions surrounding productivity metrics become even more acute when one accounts for the multifunctionality of agriculture – that is, the ways in which agriculture

³See Taylor (2015) for a longer discussion of how the climate question articulates with the agrarian question of classic and contemporary agrarian political economy alongside new approaches within political ecology.

⁴Through personal communication with the appropriate World Bank department, I was advised that this was an important issue that they haven't had time to address yet. At the time of writing, a methodology document has not yet been made public despite the CSA profile process being well advanced.

provides beneficial outcomes beyond its primary material outputs. As agroecological approaches stress, narrow understandings of productivity tend to subordinate essential biological and social functions occurring at different scales and temporal spans under the efficiency imperative of short-term yield maximisation (Altieri and Roge 2011). Efforts to improve the productivity of a given crop by finding more intensive ways to produce it through simplifying production and increasing its scale, for example, may have negative implications at a landscape level through unintended impacts such as biodiversity loss, interruption of nutrient or water cycling, degradation or contamination of neighbouring fields, and the foreclosing of common property resources. This tension is particularly important given that many agroecosystem functions cannot easily be accounted for in monetary terms and have temporalities and scales that do not fit into linear accounting of inputs and outputs at a farm level. As a result, failure to explicitly foreground new and sufficiently holistic approaches to productivity that value a wider range of ecosystem functions risk devaluing the multifunctionality of agriculture within a system ordered around expanded accumulation, profit maximisation and exponential growth (Tittone 2014).

Productivity, therefore, is not a neutral or self-evident concept but one that is constitutive of value judgements about the purposes of agriculture and the broader socio-ecological functions it serves. Being explicit about these political dimensions of productivity measures becomes even more important in the context of significant inequalities in the ability of stakeholders to exercise voice within policymaking. This is particularly the case given that relatively disadvantaged rural social groups are poorly placed to articulate and safeguard the important role agroecosystem functions play in their social reproduction (Martínez Alier 2002). For example, as Jodha, Singh and Bantilan have argued in the Indian context, common property resources that play vital roles in the reproduction of low-income rural households are often severely undermined by planning processes predicated upon standard rubrics of agricultural productivity maximisation (Jodha et al. 2012; see also Krätli 2015). When it comes to policy, what cannot be easily counted tends not to count.

The World Bank is no doubt aware of these wider political questions that surround productivity, yet it provides no normative grounds on which to even consider, never mind resolve, the resulting tensions. Nor does it recognise the significant imbalances in political voice and influence that are likely to shape debates over policy goals in practice. Rather, its unflinching emphasis on non-conflictual 'triple-win' scenarios within CSA simply exorcises complex political considerations in a manner that is strongly conducive towards the status quo. This becomes clear when we contrast the Bank's position with those of other agencies that are somewhat more attuned to the trade-offs and value judgements inherent to CSA. The FAO's 2013 sprawling *Climate-smart Agriculture Sourcebook*, for example, provides a short acknowledgement that trade-offs are an inevitable component of changes in agricultural techniques and technologies:

Whatever the 'efficiency' considered, there is a need to look at the allocation of factors and at the issue of scale. Indeed, production efficiency, GHG [greenhouse gas]-efficiency, economic efficiency and food security do not always go hand in hand. For instance, to increase the workforce in the mix of factors of production might go against economic efficiency at the farm level, but may have a positive effect on food security. (FAO 2013)

Although the FAO did not elaborate on the magnitude or implications of these inherent trade-offs, its statement nonetheless muddies the waters of the 'triple-win' claim repeatedly made on CSA's behalf. It highlights how four distinct goals of agricultural production – the creation of food, fuel or fibre for sale or subsistence; the pursuit of profitability; the

maintenance of sound ecological foundations for future production; and the contribution of agriculture in both economic and environmental terms to local communities – are expressly complex and potentially conflictual. Sadly, despite the welcome intention to place due focus on the complex interactions between agriculture, technology and livelihoods in the FAO's approach, the integration of these elements within its framework is at best partial. The trade-offs it identifies quickly lapse into those of contending productivity versus sustainability challenges. While this is a step above the World Bank's approach, it nonetheless retains a de-politicising edge because it avoids explicitly examining whose productivity and sustainability might be affected according to the associated gender, class and caste dynamics of a given agroecosystem (cf. Leach et al. 2010).

Tension 2: the black hole of resilience

These tensions stemming from the vagueness of key normative criteria are rendered acute within the second pillar of CSA: 'resilience'. Despite using this term as a foundational concept underpinning the sustainability aspects of CSA, the World Bank never provides an explicit definition, thereby leaving the meaning of resilience entirely implicit. Such analytical imprecision is perhaps not surprising given that the idea of resilience is notorious for its conceptual slipperiness (Watts 2014). Within CSA documents, resilience is typically evoked in the abstract as a valued quality that can be applied in haphazard fashion across distinct units of analysis (World Bank 2015b, 2015a, 2015c). From a crop, to a farm, the agricultural system, the landscape, a region, and the food system in its totality, resilience is viewed as a positive quality of systems that can capably withstand, or recover from, external shocks. This jumping of units and scales occurs, however, without consideration that, firstly, resilience would mean very different things in each context and, secondly, that there may be intense tensions or trade-offs between resilience at different scales and between differently positioned social groups within an agrarian environment. For instance, in many agrarian environments, the 'resilience' of a given socio-ecological system – i.e. its ability to maintain stability in the face of external shocks – is directly perpetuated at the expense of subordinate social groups within it who cushion the impacts of environmental change, e.g. landless labourers, female workers, tenant farmers, etc. (Taylor 2015). Resilience therefore needs to be considered politically: not as an abstract normative goal that applies uniformly across social categories, but practically in terms of resilience of what or whom for what purposes and at whose expense.

Such contradictions express themselves particularly strongly within CSA because a more analytically precise variant of resilience thinking could be used to critique the kinds of agricultural intensification that the Bank has typically supported and to raise pointed questions about the productivity-resilience trade-off. Consider, for example, the explicitly resilience-orientated analysis provided in the recent IIED-sponsored report *Valuing variability* on rethinking drylands development (Krätli 2015). Like CSA, this report also calls for a paradigm shift, yet one that begins from a pointed critique of the intensification imperative as applied to dryland settings. It contends that the attempt to impose a false stability of technology-driven production intensification upon drylands by simplifying and standardising their complex socio-ecologies has comprehensively failed. While productivity increases can be realised in the short term, the input-intensive package of promoting irrigation and mechanisation, the elimination of swidden, the regulation of nomadic movements, the privatisation of common resources, the introduction of monocultures and the replacement of local animals with standardised breeds have all magnified the risks facing farmers and pastoralists while undermining the ecological foundations for future

production. For the IIED, this has created a repeated mismatch between ‘the repeated attempts to reduce uncertainty to a manageable simplification, and the observable increasing of turbulence in practice’ (Krätli 2015, 25).

In chastising standard technical paradigms for productivity increase through intensification, the authors of the recent IIED-sponsored report raise the clear possibility that agrobiodiverse forms of agricultural production will create a less ‘efficient’ form of agriculture based on capitalist criteria of yields and profitability, yet be more resilient and sustainable and contribute to stronger positive externalities (see also Jackson et al. 2007). This sentiment relates to the principle underpinning socio-ecological variants of resilience thinking that building ‘diversity’ and ‘redundancy’ into agroecological systems is central to promoting their ability to withstand shocks and stresses. The idea of redundancy therein refers to the maintenance of elements of an agroecosystem that are not engineered for maximum productivity and, indeed, may seem to have little direct association with immediate productivity goals (Biggs et al. 2015). The importance of retaining such elements, despite their seeming inefficiency, is that they may assume important functions for social and/or ecological stability under changed circumstances in an uncertain future. We might consider, for example, the explicit promotion of biodiversity including the cultivation of landraces by smallholders that deliver smaller yields than commercial seeds yet may be far more tolerant to potential environmental shifts in both the short and medium term (Altieri and Koohafkan 2008). Similarly, traditional mixed farming systems – such as ‘Barah Anaaj’, the 12 food grains cropping system practiced across parts of the Himalayas – purposefully cultivate both diversity and redundancy as a risk-mitigation strategy given the uncertainties of seasonal climate variations (Zhardhari 2000).

While the IIED does not expand on the equity considerations implicit in its framework – specifically, whose resilience counts and how resilience interacts with, reinforces or undermines extant social hierarchies – the contrast with the Bank’s approach is nonetheless clear: promoting sustainability requires a fundamental rethinking of agricultural production in dryland regions that goes beyond changes to individualised production practices and market governance. It raises the key contention that yield maximisation may exist in clear and unremitting tension with broader sustainability objectives and that simplistic ‘triple-win’ technical fixes may not be possible or adequate. The option of scaling back the intensification imperative in order to promote resilience, however, does not fit comfortably in the CSA framework that enshrines productivity increases as paramount and minimises the discussion of trade-offs and conflicts between key purposes. To take such considerations seriously, however, is to consider that intensification and resilience may not be quite the happy bedfellows that the Bank projects.

Tension 3: success stories and pick ‘n’ mix agriculture

The Bank, however, would likely be unmoved by such critique. It emphasises that the purpose of CSA is not to provide a detailed overarching set of principles but rather to help parse out the diversity of existing agricultural practices and identify those that can be scaled up to sustain broadly stated triple-win outcomes. In the absence of a clear conceptual framework, the Bank instead promotes a ‘success story’ approach for CSA in which specific case examples are mobilised as exemplars of triple-win scenarios. To this end, a great deal of the CSA literature from the World Bank and associated institutions follows a standard template wherein documents move quickly from presenting an abstract sequence of normative goals – productivity, resilience, mitigation – to a list of success stories that are held to exemplify the virtues of CSA and establish its practicality on the ground (World

Bank 2011a, 2015c). As noted above, this embrace of eclecticism creates a rubric in which rainwater harvesting for peasant agriculture can sit alongside glyphosate-driven no-till monocropping systems as sequential examples of CSA despite their gulf in underlying principles and socio-ecological outcomes (see CGIAR 2013).

CSA's reliance on a template of success stories in place of substantive analysis is demonstrative of a wider trend in contemporary agriculture-development practice that has gained pace over the past decade. As James Sumberg and collaborators have argued, the growing use of success stories as a marker of good practice results from mounting pressures on development agencies to bend to a results-driven culture by constantly demonstrating the effectiveness, impacts and value added of interventions (Sumberg et al. 2012). Two salient points stem from this. First, despite the unremitting search for success, little reflection is given to who gets to define and validate success and the purposes for which they are doing so (Mosse 2011). This is compounded by the inherent vagueness of the foundational principles for CSA and the lack of a clear commitment to a participatory process in which various criteria of success and failure can be substantiated at a grassroots level (Whitfield 2015). Second, in much of the CSA literature, simplified narratives of success are used as substitutes for the complexity of causal analysis. Repeatedly, model cases of 'triple-win' solutions are removed from their historical contexts, shorn of their socio-political complexities, trimmed to remove the messy reality of unintended outcomes, and served up as an instantiation of the CSA despite their original aims being distinct. To furnish these compelling narratives of success, this process of abstraction tends to overshadow the complexities of how agroecosystems are fundamentally socio-ecological constructs that are produced and reproduced through the interaction over time of social relations, ecological processes and their associated power dynamics that are typically place specific (Gonzalez de Molina 2013).

A case in point is the use of index-based weather insurance in Bihar as a CSA success story as heralded by the World Bank and CGIAR (CGIAR 2013). Within the CSA rubric, individualised crop insurance provided by private financial institutions is held up as an innovative solution to deal with the risks inherent in agricultural production under changing climatic conditions, that promises triple-win benefits for farmers, private industry and governments alike. Troublingly, however, this model status for crop insurance is bestowed by CGIAR despite the fact that the creation of a weather insurance market in Bihar has been a contradictory institutional initiative beset with internal problems (Da Costa 2013 provides a comprehensive overview). Indeed, CGIAR's own write-up indicates that there are significant issues with design and implementation including high premiums, insufficient payouts and tenuous consumer demand. Rather than any unambiguous record of effectiveness, the making of a 'success story' out of weather insurance appears to be driven by prior institutional investments in the programme alongside a firm ideological commitment to market-driven risk mitigation through financial extension (see also Isakson 2015; Taylor 2016).

The selection of success stories is therefore a convoluted political process. It occurs not only in the CSA overview documents aimed for international consumption, but also within individual country profiles that are assembled by the World Bank. Consider, for example, the CSA profile for Peru produced by the World Bank in collaboration with the International Center for Tropical Agriculture (CIAT). In this document, the tensions between productivity and resilience goals take on a sharp relief. On the one hand, Peruvian farmers are lauded for already using a number of CSA practices that the Bank sees as derived from 'ancient Andean agriculture' (World Bank, CIAT and CATIE 2015b, 2). These include, among others, the management of native crops and livestock in traditional systems, efficient water management, soil conservation and crop associations, all of which are presented as emblematic of CSA. On the other hand, despite commending these

practices that are closely tied to traditional cultivation techniques and smallholder risk-mitigation strategies, the Bank simultaneously laments that one of the biggest challenges facing the country is the absence of ‘a critical agent for transforming subsistence farming into a modern and competitive agriculture system that promotes food security, improves incomes, and reduces poverty’ (World Bank, CIAT and CATIE 2015b, 4). The latter is to be achieved through greater market integration on both the input side – i.e. the use of appropriate commercial biotechnologies – and the output side – i.e. incorporation in agricultural value chains that are potentially global in scope.

Quite how these two elements are to be reconciled, however, is left opaque. The potential for sharp conflicts between agricultural modernisation and agroecological practices are simply smoothed over by the evocation of triple-win rhetoric operating under the assumption that the two can be seamlessly reconciled and ultimately reinforce each other. This refusal to engage with the potential for clear substantive conflicts between contrasting goals, however, is to ignore the tensions that emerge between, on the one hand, an intensification imperative imposed by competitive accumulation and, on the other, agricultural practices that prioritise a wide spectrum of social and ecological criteria within a given socio-cultural context (see Kerksen 2015 for a nuanced discussion in the Peruvian setting). Under competitive pressures, intensification habitually means that the ecosystem functions provided by biodiverse landscapes are substituted through outside inputs, thereby maintaining the integrity of the farm as a site of intensive productivity yet at the result of sacrificing biodiversity, localisation and nutrient cycling (Tittonell 2014, 54). This is why many agrarian environments that are presently most vulnerable to climate change impacts are those that historically have been at the centre of intensification initiatives, most notably the epicentre of the Green Revolution in the Indian Punjab (Singh 2010).

At a political level, tensions between short-term profit maximisation and broader sustainability goals force us to consider whether the furthering of sustainable agricultural production methods might well require a greater degree of autonomy – not integration – of smallholders from competitive market forces (see van der Ploeg 2013, for a broader theoretical discussion). Predicated upon the intensification imperative, however, the Bank’s approach appears unable to separate itself from the idea that market integration remains foundational to sustainability questions. CSA planning documents repeatedly argue that close integration into value chains is a prerequisite for triple-win solutions owing to the opening of market opportunities and access to new biotechnologies (World Bank 2013, 2015a, 2016). This well-established trope of smallholders that are ‘excluded’ from markets, therein perpetuating their backwardness, ignores that it is not integration per se that is commonly the issue, but rather the terms of integration and the relative power of the involved actors (Mosse 2007; Taylor 2013). Many smallholders tend to be strongly integrated into market relations, yet this occurs on terms that can be manifestly disadvantageous for them (Akram-Lodhi 2013). For the Bank, however, the idea that the marketisation of agriculture has uneven, unequal and unintended outcomes remains anathema to its fundamentally linear vision of agrarian modernisation through commercialisation.

Tension 4: the missing act of consumption

A fourth core tension in the CSA framework is that, while farming is to be judged according to the efficiency of its productivity and resilience, there is a clear and steadfast refusal to avoid similar reflection on contemporary consumption trends. As a result, questions of distribution and consumption are conspicuous by their absence throughout the CSA literature. There is no acknowledgement, for example, that the kinds of commercialised value-chain agriculture

that the Bank promotes are based on a fundamental tension: they orientate the production and distribution of food and agricultural materials not to where they are needed but to where they can be purchased. CSA therefore avoids engaging with how consumer sovereignty bends global food production towards elite consumption demands – especially the meatification of diets – despite their socio-ecological inefficiency and contribution to climate change (Weis 2013). By inscribing thick parameters around CSA as a production-level transformation, the Bank contributes to a situation in which ‘[t]he current demand trends for biofuels, excessively meat-based diets and post-harvest food waste are accepted as given, rather than challenging their rationale’ (UNCTAD 2013, 7). The refrain of constantly producing more under the intensification imperative thereby feeds into a global division of consumption that is starkly stratified and desperately inefficient in its use of biomass and energy. At its very core, the Bank’s presentation of CSA can be argued to express an anxious desire to avoid having to face troubling questions around sharply uneven distributions of consumption through which access to food is highly skewed at a global level.

Consider, for example, the CSA profile for Argentina in which the Bank argues that the country has in many respects largely adopted key CSA practices, making it an exemplary case. Argentina’s high CSA rating primarily rests on the transformation of the pampas into vast monocultures of soy, maize and wheat production under the extensive usage of no-till agriculture for the planting of large-scale monocultures of herbicide-resistant soy. The latter is, according to the Bank, a consummate example of a triple-win scenario by virtue of reductions in gasoline to operate farm machinery owing to economies of scale, better soil health and less erosion owing to no-till practices, and less toxicity owing to the widespread replacement of more virulent herbicides with the relatively less toxic glyphosate (World Bank, CIAT and CATIE 2015a). This transformation, the Bank notes, was not the result of a planned transition to CSA. Rather, it occurred through the autonomous and self-interested decision-making of large farmers seeking enhanced profitability. In the Bank’s terms, for CSA to take hold, ‘farmers need to see how they can sustainably “make money, save money, or save time” before they are likely to change their behaviours, adopt new practices or invest in new technologies’ (World Bank 2015c, 18).

In designating Argentina as paradigm case of CSA, however, we are faced with a troubling reductionism that manifests itself in two clear tensions. First, by judging smartness in terms of the relative change between previous and present methods, the Bank is able to present glyphosate-driven monocropping as a model technology on the basis that it represents an improvement in yields and emissions over the ecologically inefficient industrial forms of agriculture that preceded it. This reading, however, ignores the remaining dependence of such farming practices on carbon-intensive and chemical-intensive technologies; the major destruction of biodiversity through the extension of cropland into forested areas; the intensive consolidation of land ownership and the associated evictions of smallholders; and the escalating environmental contradictions in the form of glyphosate-resistant weeds, soil degradation and groundwater contamination (Oliveira and Hecht 2016; Otero and Lapegna 2016; Lapegna 2016).

Second, by limiting the scope of CSA to technical changes at the point of production, the Bank steadfastly refuses to incorporate a holistic approach that places agricultural production as one moment of value chains involving wider flows of materials and energy that stretch across boundaries. Marx once famously complained that bourgeois political economy would not enter the hidden abode of production, yet CSA adamantly refuses to leave it. In this respect, the output of Argentinean soy plantations – which account for some 45 percent of the country’s cropland – is directed towards the feeding of industrial livestock that has sharply negative environmental implications and is a major producer

of greenhouse gasses (Weis 2013; FAO 2006; Schneider 2017). In the Argentinean case, climate-smart agriculture appears to be the foundation for what could be labelled as a climate-stupid value chain.

In conclusion: towards a climate-wise food system?

If one was hoping for an ‘epistemic reorientation’ in the face of actual and projected biophysical changes and social inequities (McMichael 2011), the World Bank’s rendering of CSA and its associated vision of agrarian transformation presents very little that is new. In the Bank’s rendition, CSA is an obligatory field-level supplement designed to safeguard agricultural intensification from climate change impacts. In this respect, the Bank explicitly integrates CSA into its longstanding modernisation narrative in which the problems of the global food system are largely to be tackled by increasing supply through liberalisation, technological advancement and the diffusion of modern production techniques to the developing world. To be certain, the Bank now insists that this goal of increased productivity must be sustained through appropriately remodelled production techniques that promote resilience and decrease emissions. In abstract terms, these goals are indeed worthy ones and the Bank highlights that their achievement may involve the adoption of broadly agroecological cultivation methods in some instances.

Yet despite this welcome broadening of the policy repertoire, by conceptually isolating CSA as a technical fix to address climate change impacts, the Bank conspicuously avoids interrogating the socio-political dimensions of the contemporary food system. It thereby proposes a paradigm shift in agriculture without acknowledging the vast inequalities of access to land, inputs, water and food that stratify contemporary patterns of food production, distribution and consumption. Simultaneously, by failing to acknowledge the social and environmental contradictions that have accompanied the previous half-century of agricultural intensification, it is poorly placed to understand why its contrasting goals of productivity, resilience and mitigation often resist being seamlessly reconciled under ‘triple-win’ scenarios in which conflicts of interest are assumed to be absent. Contradictions between contrasting goals are simply glossed over with triple-win rhetoric and there is scant recognition that the benefits and costs of transforming agricultural systems can fall unevenly between differently situated social groups.

As a result, notwithstanding its yearning to fold the climate question under a unified and apolitical framework of agricultural transformations at the level of production, the presence of these tensions means that CSA will unavoidably become a battleground for conflicting visions of agrarian futures. This raises a key question: where does the vacuous political content of climate-smart agriculture – with its strongly ‘post-political’ drift – leave progressive agrarian academics and movements seeking to shift the discursive frame? As noted above, a number of key agrarian justice groups have officially condemned CSA and refuse to engage the institutional networks that are being constructed around it. *La Via Campesina*, for example, labels CSA as nothing more than a foil under which the increasing corporatisation of global agriculture can be hastened. They, along with numerous other transnationally orientated agrarian movements, pointedly signed a joint declaration decrying the initiative and therein steadfastly refusing to engage CSA as a viable rubric for discussing contemporary agrarian change.⁵ Despite this strong repudiation, however,

⁵See the statement by *La Via Campesina* available at <http://www.climatesmartagconcerns.info/cop21-statement.html> (accessed 10 December 2016).

CSA continues to exert a gravitational pull on the policy environment and is proving impossible for many grassroots organisations to ignore. At both international and national levels, frameworks are being formulated and resources distributed within the auspices of CSA. Many agrarian organisations are therefore forced to engage with the rubric as part of their daily operations and engagements with governmental agencies. Despite their evident suspicions, they often seek to leverage a more progressive politics within its shadows.

In this respect, an alternative strategy to outright negation of CSA may be to steal a little fire from the official discourse by supplanting the rubric of 'climate-smart' with a more encompassing and progressive vision of being 'climate-wise'. Such a plan would use the climate-wise label as a means to link the climate question to the concerns that have motivated 'food sovereignty' as a countervailing discourse that foregrounds the political dimensions of food production, distribution and consumption (Akram-Lodhi 2015). This would entail directly opposing the technical and productivist focus of CSA and, instead, explicitly articulating a holistic vision of a 'climate-wise food system' that places equity and sustainability concerns at the forefront. In clear distinction to CSA, becoming climate wise is to recognise that it is not always possible to have one's cake and eat it too. While win-win solutions may be ideologically desirable, in the real world of agriculture there will be sharp conflicts and trade-offs to be made between the goals of productivity, sustainability and mitigation. These must be conceptualised within an explicit discussion of access and equity concerns so we can better grasp the differentiated impacts of policy measures upon social groups at both production and consumption levels.

On this basis, the framework of a climate-wise food system might seek to emphasise four key points – well represented within the literatures on food sovereignty and agroecology – that would form an alternative normative starting point. First, climate change amplifies concerns over access to sufficient and nutritious food and therefore makes the question of food distribution equally important as food production. It is notable, for example, that the World Bank's myriad success stories of CSA do not incorporate any public programme that seeks to link production to consumption, because distribution is conceptually isolated as the preserve of markets despite their manifest inefficiencies in securing the right to food. The question of access, however, must be the critical pivot of a climate-wise food system. Second, shifts in consumption patterns are an essential element of a climate-wise food system. The tyranny of consumer sovereignty – which reflects the embedded power of money as a claim on global resources – should not be allowed to dictate its dynamics. The ability of climate-smart agriculture to produce climate-stupid foodstuffs – such as the mass-production of soy and corn for sustaining factory meat production and biodiesel – must be challenged. Not only is it not possible to have one's cake and eat it too, a climate-wise food system is about stopping affluent consumers dictating what the cake's ingredients are.

Third, a climate-wise food system would be predicated upon strong normative preference for ecological intensification in which biological processes in combination with human labour underscore productivity advances, rather than cheap energy inputs (Tiftonell 2014). This would require a degree of localisation in which the multifunctionality of agrarian landscapes can be properly considered and safeguarded in a regional context by reinvesting in biodiversity as a pre-requisite for present and future sustainability. And, fourth, at a political level, climate-wise approaches must both be participatory and explicitly challenge the politics of knowledge production in which the concentrated power of agrocorporations – stemming from an increasingly oligarchic hold over agricultural research, input and output markets – disproportionately influences political debates on agrarian

futures in favour of the status quo. Together, these climate-wise norms form a platform on which the apolitical leanings of CSA can be duly challenged.

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References

- Akram-Lodhi, A. H. 2013. *Hungry for change: farmers, food justice and the agrarian question*. Halifax: Fernwood.
- Akram-Lodhi, A. H. 2015. Accelerating towards food sovereignty. *Third World Quarterly* 36, no. 3: 563–83.
- Altieri, M., and P. Koohafkan. 2008. *Enduring farms: climate change, smallholders and traditional farming communities*. Penang: Third World Network.
- Altieri, M., and P. Røge. 2011. The ecological role and enhancement of biodiversity in agroecosystems. In *Agriculture, biodiversity and markets: livelihoods and agroecology in comparative perspective*, ed. S. Lockie, and D. Carpenter, 15–32. London: Earthscan.
- Biggs, R., M. Schluter, and M. Schoon. 2015. *Principles for building resilience: sustaining ecosystem services in social-ecological systems*. Cambridge: Cambridge University Press.
- Campbell, B., P. Thornton, R. Zougmore, P. van Asten, and L. Lipper. 2014. Sustainable intensification: what is its role in climate smart agriculture? *Current Opinion in Environmental Sustainability* 8, no. 1: 39–43.
- CGIAR. 2013. *Climate-Smart agriculture success stories from farming communities around the world*. Montpellier: CGIAR.
- Chant, S. 2012. The disappearing of ‘smart economics’? The World Development Report 2012 on gender equality: some concerns about the preparatory process and the prospects for a paradigm change. *Global Social Policy* 12, no. 2: 198–218.
- Chant, S., and C. Sweetman. 2012. Fixing women or fixing the world? ‘smart economics’, efficiency approaches, and gender equality in development. *Gender and Development* 20, no. 3: 517–29.
- Da Costa, D. 2013. The ‘rule of experts’ in making a dynamic micro-insurance industry in India. *The Journal of Peasant Studies* 40, no. 5: 845–65.
- Elson, D. 2012. Review of World Development Report 2012: gender equality and development. *Global Social Policy* 12, no. 2: 178–84.
- FAO. 2006. *Livestock’s long shadow: environmental issues and options*. Rome: FAO.
- FAO. 2010. *“Climate-Smart” agriculture: policies, practices and financing for food security, adaptation and mitigation*. Rome: FAO.
- FAO. 2013. *Climate smart agriculture sourcebook*. Rome: Food and Agriculture Organisation.
- Fleming, J. R., and V. Jankovic. 2011. Revisiting *Klima*. *Osiris* 26, no. 1: 1–15.
- Gliessman, S. 2013. Agroecology: growing the roots of resistance. *Agroecology and Sustainable Food Systems* 37, no. 1: 19–31.
- Gonzalez de Molina, M. 2013. Agroecology and politics: How to get sustainability? The necessity for a political agroecology. *Agroecology and Sustainable Food Systems* 37, no. 1: 45–59.
- Hulme, M. 2011. Reducing the future to climate: A story of climate determinism and reductionism. *Kima* 26, no. 1: 245–66.
- IPCC. 2007. *Climate change 2007: The scientific basis. WG I contribution to IPCC 4th assessment report*. Cambridge: Cambridge University Press.
- Isakson, R. 2015. Derivatives for development? small-farmer vulnerability and the financialization of climate risk management. *Journal of Agrarian Change* 15, no. 4: 569–80.

- Jackson, L. E., U. Pascual, and T. Hodgkin. 2007. Utilizing and conserving agrobiodiversity in agricultural landscapes. *Agriculture, Ecosystems and Environment* 121: 196–210.
- Jodha, N., N. Singh, and C. Bantilan. 2012. The commons. *Communities and Climate Change, Economic & Political Weekly XLVII*, no. 13: 49–57.
- Kerssen, T. M. 2015. Food sovereignty and the quinoa boom: challenges to sustainable re-peasantisation in the southern Altiplano of Bolivia. *Third World Quarterly* 36, no. 3: 489–507.
- Krätli, S. 2015. *Valuing variability: New perspectives on climate resilient drylands development*. London: IIED.
- Lapegna, P. 2016. *Soybeans and power: genetically modified crops, environmental politics, and social movements in Argentina*. Oxford: Oxford University Press.
- Leach, M., I. Scoones, and A. Stirling. 2010. *Dynamic sustainability: technology, environment, social justice*. London: Earthscan.
- Loos, J., D. Abson, M. J. Chappell, J. Hanspach, F. Mikulcak, M. Tichit, and J. Fischer. 2014. Putting meaning back into “sustainable intensification”. *Frontiers in Ecology and the Environment* 12, no. 6: 356–61.
- Martínez Alier, J. 2002. *The environmentalism of the poor: a study of ecological conflicts and valuation*. Cheltenham: Edward Elgar.
- McMichael, P. 2011. Food system sustainability: questions of environmental governance in the new world (dis)order. *Global Environmental Change* 21, no. 4: 804–12.
- Méndez, V. E., C. Bacon, and R. Cohen, eds. 2015. *Agroecology: A transdisciplinary, participatory and action-orientated approach*. Santa Fe: CRC Press.
- Mosse, D. 2007. Power and the durability of poverty: a critical exploration of the links between culture, marginality and chronic poverty. *CPRC Working Paper, Anthropology Department, SOAS* 107: 1–60.
- Mosse, D. 2011. The anthropology of expertise and professionals in international development. In *Adventures in Aidland: The anthropology of professionals in international development*, ed. D. Mosse, 1–31. New York: Berghahn Books.
- Neufeldt, H., M. Jahn, B. Campbell, J. Beddington, F. DeClerck, A. De Pinto, J. Gullede, et al. 2013. Beyond climate-smart agriculture: toward safe operating spaces for global food systems. *Agriculture & Food Security* 2, no. 12: 1–6.
- Oliveira, G., and S. Hecht. 2016. Sacred Groves, sacrifice zones and soy production: globalization, intensification and neo-nature in South America. *The Journal of Peasant Studies* 43, no. 2: 251–85.
- Otero, G., and P. Lapegna. 2016. Transgenic crops in Latin America: expropriation, negative value and the state. *Journal of Agrarian Change* 16, no. 4: 665–74.
- van der Ploeg, J. 2013. *Peasants and the Art of farming: A Chaynovian manifesto*. Halifax: Fernwood.
- van der Ploeg, J. 2014. Peasant-driven agricultural growth and food sovereignty. *Journal of Peasant Studies* 41, no. 6: 999–1030.
- Roberts, A., and S. Soederberg. 2012. Gender equality as smart economics? A critique of the 2012 World Development Report. *Third World Quarterly* 33, no. 5: 949–68.
- Schneider, M. 2017. Wasting the rural: meat, manure and the politics of agro-industrialization in contemporary China. *Geoforum* 78, no. 1: 89–97.
- Singh, K. 2010. ‘Agrarian crisis in Punjab: high indebtedness, Low returns, and Farmers’ suicides’. In *Agrarian crisis in India*, ed. D. N. Reddy, and S. Mishra, 261–83. New Delhi: Oxford University Press.
- Sumberg, J., R. Irving, E. Adams, and J. Thompson. 2012. Success-Making and success stories: agromonic research in the spotlight. In *Contested agronomy: agricultural research in a changing world*, ed. J. Sumberg, and J. Thompson, 186–203. London: Earthscan.
- Taylor, M. 2013. Climate change, relational vulnerability and human security: rethinking sustainable adaptation in agrarian environments. *Climate and Development* 5, no. 4: 318–27.
- Taylor, M. 2015. *The political ecology of climate change adaptation: livelihoods, agrarian change and the conflicts of development*. London: Routledge.
- Taylor, M. 2016. Risky ventures: financial inclusion, risk management and the uncertain rise of index-based insurance. *Research in Political Economy* 31, no. 1: 267–95.
- Tittonell, P. 2014. Ecological intensification of agriculture - sustainable by nature. *Current Opinion in Environmental Sustainability* 8, no. 1: 53–61.
- UNCTAD. 2013. *Trade and environment review 2013*. Geneva: United Nations.

- Via Campesina. 2015. *Peasant agroecology for food sovereignty and mother earth*. Harare: Zimbabwe.
- Watts, M. 2014. Resilience as a way of life: biopolitical security, catastrophism, and the food-climate change question. In *Bioinsecurity and vulnerability*, ed. N. Chen, and L. Sharp, 145–75. Santa Fe: SAR Press.
- Weis, T. 2013. *The global hoofprint: The global burden of industrial livestock*. London: Zed Books.
- Whitfield, S. 2015. *Adapting to climate uncertainty in African agriculture: narratives and knowledge politics*. London: Routledge.
- World Bank. 2006. *Managing climate risk: integrating adaptation into World Bank Group operations*. Washington, DC: World Bank Group.
- World Bank. 2007. *World Development Report 2008: agriculture for development*. Oxford: Oxford University Press.
- World Bank. 2009. *World Development Report 2010: development and climate change*. Washington: The World Bank.
- World Bank. 2011a. *Climate-smart agriculture: A call to action*. Washington: World Bank Group.
- World Bank. 2011b. *World Development Report 2012: gender equality and development*. Washington: World Bank Group.
- World Bank. 2013. *World Bank Group agriculture action plan, 2013–15*. Washington, DC: IBRD.
- World Bank. 2015a. *Accelerating climate-resilient and Low-carbon development: The Africa climate business plan*. Washington, DC: World Bank.
- World Bank. 2015b. *Ending poverty and hunger by 2030: An agenda for the global food system (second edition)*. Washington: World Bank Group.
- World Bank. 2015c. *Future of food: shaping a climate-smart global food system*. Washington, DC: World Bank.
- World Bank. 2016. *World Bank Group climate change action plan*. Washington: IBRD.
- World Bank, CIAT and CATIE. 2015a. *Climate-smart agriculture in Argentina. CSA country profiles for Latin America series*, 2nd. ed. Washington, DC: The World Bank Group.
- World Bank, CIAT and CATIE. 2015b. *Climate-smart agriculture in Peru. CSA country profiles for Latin America series*. Washington, DC: The World Bank Group.
- World Business Council for Sustainable Development. 2015. *Low carbon technology partnerships initiative: climate smart agriculture*. Geneva: World Business Council for Sustainable Development.
- Zhardhari, V. 2000. “Barah Anaaj”—twelve food grains: traditional mixed farming system. *Leisa India* 2, no. 1: 25–26.

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