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Pathways Towards Sustainable Soil and Land Governance: Discussing the Contribution of the Global Soil Week

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Abstract

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In the Anthropocene, humankind has become a quasi-geological force. As such, we are continuously transforming soils, an essential and in human timeframes finite resource, in unsustainable ways. To preserve this precious resource, we need to steer soil and land use patterns towards more sustainable pathways. This requires soil and land governance that considers and resolves various soil- and land-related challenges to sustainable development, from nutrient mining to inequitable access to fertile land. The main goal of the paper is to discuss the Global Soil Week as a contribution to the emerging soil and land governance landscape. Recent paradigms in analysis and practice of sustainability governance form the backdrop of the debate. It is argued with the help of literature that sustainability of dynamic resource systems such as soils can be achieved through adaptive governance which builds on networked and multi-level governance approaches. Further, dealing with the social and political dynamics in co-generating knowledge and solutions requires reflexive and deliberative governance. The Global Soil Week provides a platform for building networks across scales involving multiple stakeholders. Particular emphasis is given to the co-generation of knowledge and solutions between scientists and decision makers, in other words to transdisciplinary approaches. To that end, the Global Soil Week is not only a platform but also a process providing space and time for these various stakeholders to interact. The Global Soil Week itself needs to be subject to critical reflection. A particularly pertinent question in this regard is how to best link an international event to on-going political processes at various scales. In conclusion, the paper offers an outlook on how the analysis of the Global Soil Week as a case is likely to provide insights into the conceptual debate on the governance of transformations towards sustainability.

Keywords: *soil and land governance, ecosystem services, trade-offs, sustainability governance, transdisciplinarity*

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Content

Introduction

Soils provide essential ecosystem services for human well-being and ecosystem functioning, such as food, water regulation, biodiversity conservation and carbon storage (Lal et al. 2007; Lal et al. 2012). In the Anthropocene (Crutzen 2002), our current soil use patterns threaten the provision of these ecosystem services. Thinking in human time horizons, soils are a finite resource. It takes about 500 years for a 2.5 cm layer of fertile topsoil to form in land used for agricultural purposes (Pimentel et al. 2010). However, we lose over 24 billion tons of fertile soil from agricultural lands every year due to wind and water erosion (Quinton et al. 2010; Bai et al. 2008).

Land degradation processes and land scarcity often occur in regions that are additionally water-scarce, thereby limiting the opportunities for agricultural production through adaptation (FAO 2011a). Taking the example of several southern African countries, these are also often the regions characterized by high population growth (UNFPA 2012: 114). Due to population growth, global available arable land per capita has halved since the 1950s (see Figure 1, FAO 2011a).

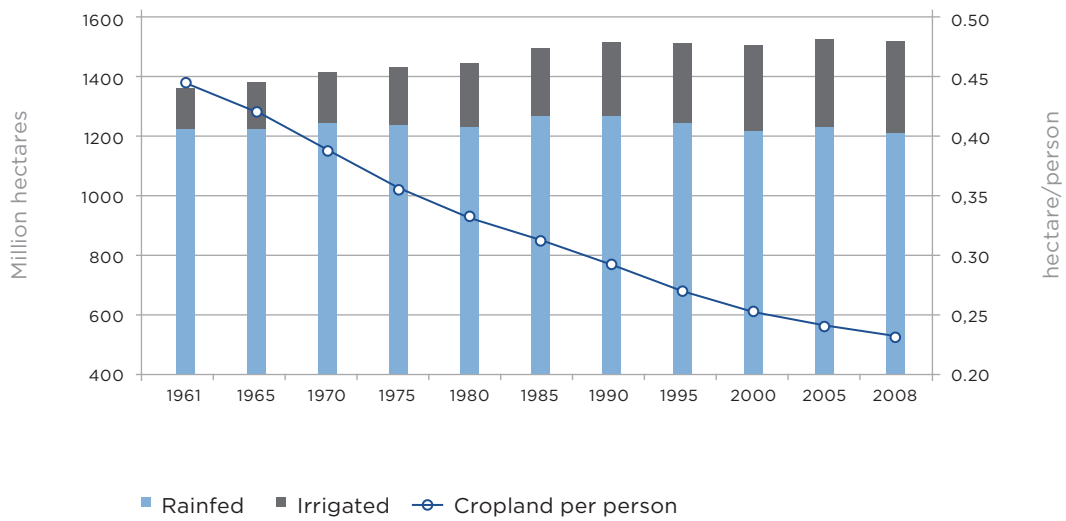

Figure 1: Reduction in agriculturally usable land per capita, 1961–2008

Source: FAO (2011a: 24).

Often, land rights regimes do not match the global and common-pool resource character of soil ecosystem services. Thus, institutional misfits are no exception to the rule. Moreover, in many places, these regimes marginalize certain societal groups, especially women. Across all world regions, women hold fewer – or less secure – rights to land than men (FAO 2002; FAO 2011b; The Global Initiative for Economic, Social and Cultural Rights 2013). These few examples show that we urgently need to improve the situation of soils globally and therefore put in place governance mechanisms that foster sustainable transformations.

During the past two decades, scholars and practitioners alike developed a wide range of sustainability governance concepts. There is now increasing recognition of the need to develop multi-level, adaptive and deliberative governance regimes to achieve sustainability (Leach et al. 2007). At the same time, the landscape of global land and soil governance has become more complex: There is the United Nations Convention to Combat Desertification, with its particular mandate to work in arid, semi-arid and dry sub-humid areas. In 2011, the FAO founded the Global Soil Partnership, mandated to improve governance of the planet's limited soil resources in order to guarantee healthy and productive soils for a food-secure world. In addition, there are attempts to establish regional soil governance approaches, such as the European Soil Framework Directive.

The purpose of this paper is to begin a process of reflection on emerging mechanisms for global governance of land and soil, and to discuss the possible contribution of the Global Soil Week to this soil and land governance landscape. Sustainability governance principles serve as the backdrop to this discussion. The paper is written – from the perspective of a participant observer – by members of the host organization of the Global Soil Week, the Institute for Advanced Sustainability Studies (IASS). From the transdisciplinary perspective of the IASS, the paper also intends to contribute to the conceptual discussion on sustainability governance.

The paper proceeds as follows. The next section outlines challenges related to soil and land governance. The third section describes principles of sustainability governance to which soil and land governance mechanisms would need to respond in order to address these challenges. The section also emphasizes the process character of governance. The fourth section then describes and discusses the Global Soil Week against the backdrop of the principles of sustainability governance. In conclusion, the paper emphasizes the platform character of the Global Soil Week as a way to explore new ways of knowledge production and process governance.

1. Challenges of Soil and Land Governance in the Nexus

Soils and other natural resources are fundamental to securing the availability of food, energy and fresh water. There are trade-offs that need to be balanced in providing these and other ecosystem services. In a world in which 842 million people go hungry (FAO et al. 2013), and in which many live in conditions of chronic poverty (Hulme and Shepherd 2003) and are left without voice, the key question is what kind of governance is needed such that everybody can benefit from essential soil ecosystem services: How to ensure that marginalized voices come to influence decisions on the distribution of these ecosystem services?

1.1 Understanding and managing the trade-offs in soil ecosystem services

Soils provide a wide range of essential ecosystem services for human well-being and ecosystem functioning (Lal et al. 2012). Provisioning services provided by soils include the supply of food, timber and fiber, habitats and raw materials as well as biodiversity and genetic resources. More than 90% of food worldwide is produced in soil (Pimental et al. 2010). Regulating services of soils ensure a stable, healthy and resilient environment. Soils have the capacity to mitigate floods and lessen the impacts of extreme climatic events by storing and retaining water. They filter nutrients and thereby control the proliferation of pests and diseases and improve water quality. They also contribute to combating climate change by regulating atmospheric constituents and storing carbon as stable organic matter (Lal et al. 2012; Dominati et al. 2010; Haygarth and Ritz 2009). Soils store over 4,000 billion tons of carbon, which is approximately ten times more than that stored by the world's forests (Eswaran et al. 2000; Jobbágy and Jackson 2000). Supporting services provided by soils include soil formation, primary production and nutrient cycling (Haygarth and Ritz 2009). Soil provisioning and regulating services, in particular, occur at very different scales ranging from the micro-level (e.g. habitat for micro-organisms) to landscape (e.g. erosion control) to the global level (e.g. climate regulation) (Dominati et al. 2010).

Soils are involved in complex, often unpredictable, and sometimes irreversible interactions and non-linear relationships over time and space, which are often only poorly understood (Bennett et al. 2009; Hancock 2010; Raudsepp-Hearne et al. 2010; Rodriguez et al. 2006). Due to the complexity of interactions, ecosystem services may be affected negatively (trade-off) or positively (synergy) as the provision of one service increases (Elmqvist et al. 2011). A trade-off occurs, for example, when increased provision of agricultural crops has the effect of negatively impacting soil quality, carbon storage and water regulation (Elmqvist et al. 2011; Haygarth and Ritz 2009). A trade-off may further arise when arable land with productive soils is converted and sealed due to urban development (see Figure 2).

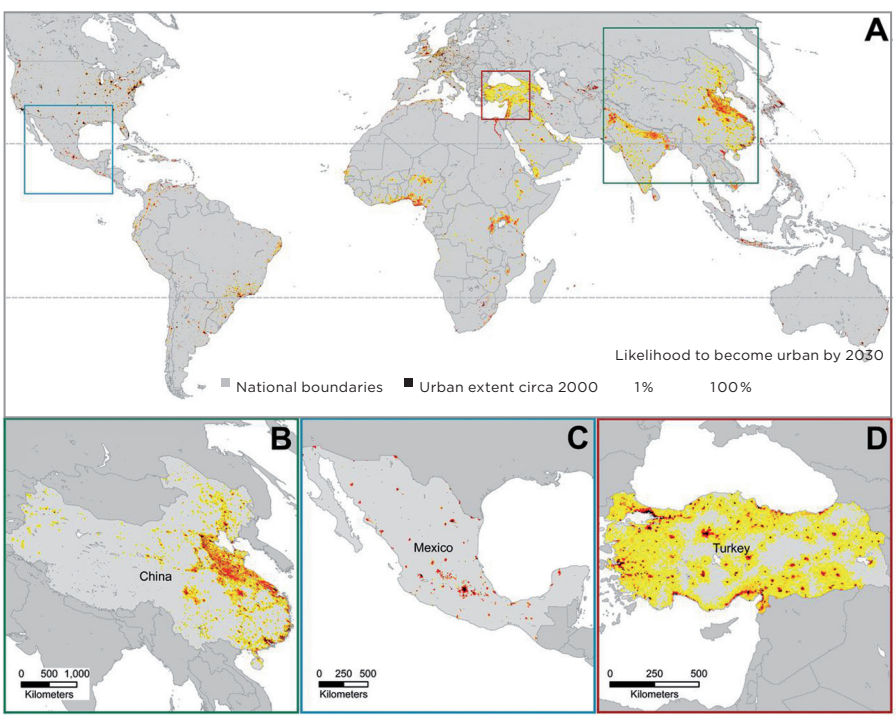

Figure 2: Global forecasts of probabilities of urban expansion to 2030

There is significant variation in the amount and likelihood of urban expansion (A). Much of the forecasted urban expansion is likely to occur in eastern China (B). Some regions have high probability of urban expansion in specific locations (C) and others have large areas of low probability of urban growth (D).

Source: Seto et al. (2012: 16084).

This represents a critical tipping point, as it is often impossible to restore the original conditions of the soil and its ecosystem services. Moreover, since soil formation takes hundreds of years, the loss of soil resources is permanent in terms of human timeframes (Haygarth and Ritz 2009). Given the uncertainty in the relationships between ecosystem services, a soil and land governance regime would, first and foremost, need to be adaptive to newly emerging insights into these relationships.

Soil ecosystem services are enjoyed at different scales and time horizons (Fremier et al. 2013). Concerning scale, some services are appropriated rather privately by local users, whereas other services such as flood mitigation are local or regional common goods. The issue of governance becomes more complex in the case of globally relevant common services such as mitigating climate change through carbon storage. Moreover, through international trade land use is displaced (see Figure 3). This virtual land import or export means that if products are internationally traded, the land required to produce them is being indirectly traded, too. This displacement of land use raises issues of co-responsibility for losses of soil ecosystem services and biodiversity (Weinzettel et al. 2013). These globally relevant ecosystem services necessitate a global approach to govern them. However, as efforts towards drafting and implementing a governance framework are being made at global, regional and national levels, it is the multitude of actors at various sub-national levels who contribute to the problem or a solution through their decisions and actions under different governance regimes[1] – and this is not to speak of the 'institutional fatigue' at the global level that has hampered the creation of global institutions since immediately after the Rio 'Earth Summit' of 1992. The very nature of the trade-offs in services across different scales provides a prima facie argument for a networked or nested polycentric governance approach (Andersson and Ostrom 2008).

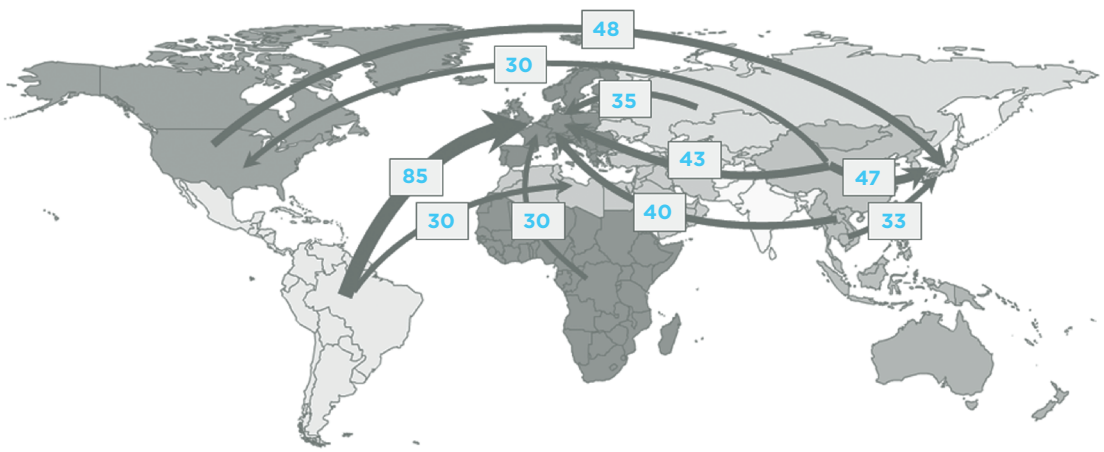

Figure 3: Virtual land: Displacement of land use measured in million global hectares per year

The figure shows the top ten net displacements of land use globally (exports minus imports), with the arrows indicating the direction of product flow.

Source: Weinzettel et al. (2013: 436).

[1] *Paavola et al. (2009: 149) differentiate between governance frameworks, "...which include those specific, purposive governance interventions that are developed by multiple actors at multiple scales in pursuit of a broad goal", and governance regimes, "...which encompass the whole range of customs, norms and rules that shape a particular object".*

Regarding the time scale, short-term solutions for increased production based on specific interests might conflict with longer-term strategies for sustainable development. Some of these short-term interventions undermine the ability of soils to maintain fundamental ecosystem services even in a mid-term perspective, and create new and poorly understood feedbacks. To ignore these complex feedbacks often leads to the inefficient use and overexploitation of some services (mostly provisioning services to meet short-term yield increases). This is detrimental to the overall integrity of ecosystems and has long-term negative consequences for human well-being (Bohensky et al. 2006). In addition, those groups who provide services (like carbon storage in soils under sustainable land management) might not be those who reap the benefits (Fremier et al. 2013).

The challenge we are facing is how to govern the possible trade-offs – and beneficial synergies – in the use of soil resources across multiple temporal and spatial scales, so that the provision of ecosystem services is balanced for human well-being and the protection of the ecosystem (Haygarth and Ritz 2009). The negative economic and social implications of current soil use patterns demonstrate the failure of soil and land regimes at various scales to provide appropriate pathways for decisions and actions in response to these challenges. Several approaches have been suggested to govern trade-offs and synergies in ecosystem services, based on concepts such as "Ecosystem Services Districts" (Elmqvist et al. 2011) and "planetary boundaries" (Rockström et al. 2009; Schmidt 2013).

However, it is important to be aware that ecosystem services, boundaries, districts and the like are socially constructed categories. This means that they inherently entail political consequences and influence the associated allocation of use and access rights to soil and land. When concepts such as these gain political momentum, it is crucial to be aware that implementing them requires normative judgment and – ultimately – societal choices. For this, it is essential, during the development and application of these concepts, to recognize the voices of those who will be affected.

1.2 Distribution of soil ecosystem services and access to land

Soil ecosystem services are not enjoyed to the same degree by all people, as the example of global food insecurity clearly demonstrates. In many rural contexts in the Global South, the distribution of access to soil ecosystem services is strongly influenced by access to land. Thus, responsible forms of land governance are a pre-condition for sustainable soil governance. Institutions for equitable and secure access to land resources for those whose livelihoods are dependent on them have been a persistent and contentious policy issue. Land is an extremely inequitably distributed resource, with an average Gini coefficient[2] of 0.65 for selected countries in Africa, the Americas, Asia and Europe (Deininger and Olinto 2000; Table 1 presents an excerpt).

UN Region	Inequality in land distribution Average Gini coefficient	No. of countries covered/region
Africa	0,61	9
Asia	0,57	17
Europe	0,57	14
Latin America & the Carribean	0,82	16
North America	0,64	2

Table 1: Socially constructed scarcities

Source: Authors' own calculations based on Deininger and Olinto (2000: 24).

[2] The Gini Index is often used to measure the inequality of income or wealth distribution. A Gini Index of 0 indicates perfect equality; a Gini Index of 1 indicates complete inequality.

The emerging trend of international investments in land through lease or purchase further exacerbates the insecurities in accessing land resources. For the period of 2001 to 2010, the International Land Coalition reported that 203 million hectares of land were considered for or negotiated in international land deals. There is a large volume of case studies highlighting the often negative implications of these land acquisitions for impoverished communities around the world (White et al. 2012; Oxfam 2011). While these investments hold the potential to channel urgently needed funds into agriculture (von Braun 2009), it is crucial to bear in mind that the majority of these investments occur in regions of weak land governance. In other words, good governance is a necessary condition to reap the benefits of such investments. However, Arezki et al. (2011: 17) find that "one standard deviation deterioration in the land governance index (equivalent to the difference between Angola and Brazil) would be predicted to increase the number of investment projects by 33% even with other factors held constant (such as land abundance which would be associated with weaker land governance)". These figures suggest that investors prefer weak governance contexts within which to acquire land. This might pose additional challenges in turning investments beneficial to those affected by them.

This is compounded by another observed phenomenon: the distribution of fertile soils is even more skewed. The poorer people are, the more likely they are to live on degraded lands or lands with strong degradation trends (FAO 2011a: 66; see Figure 4).

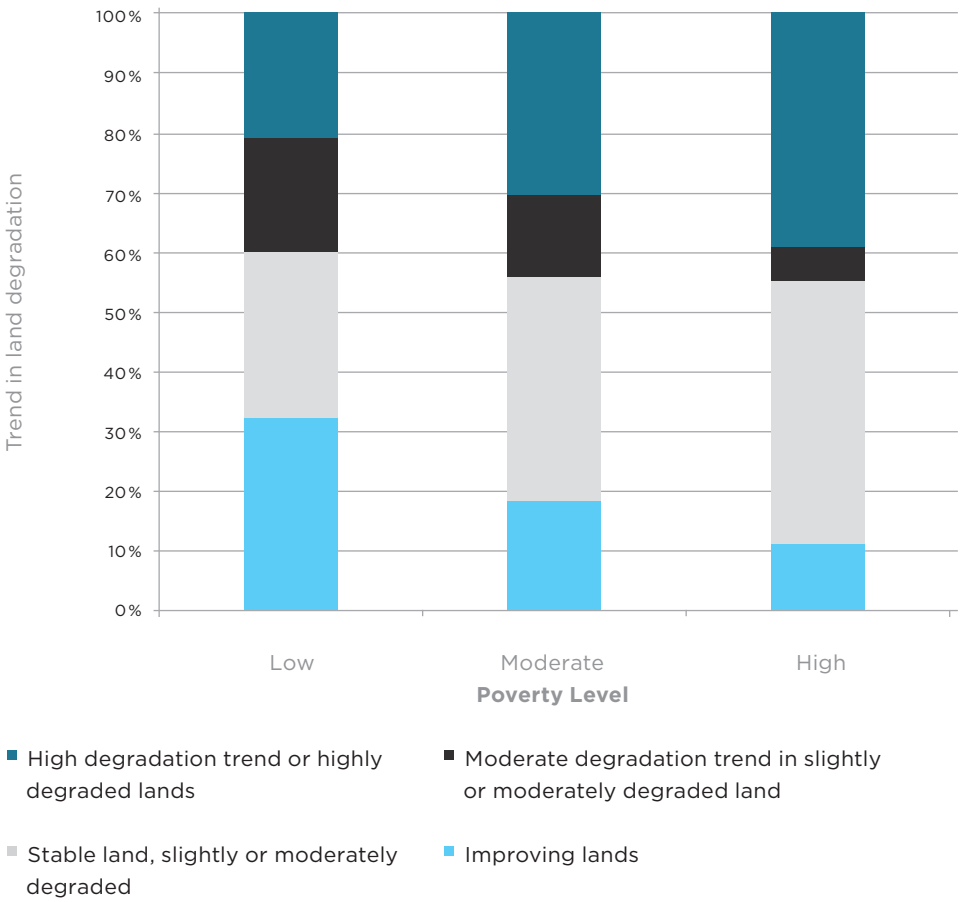

Figure 4: The relation between land degradation and poverty

Source: Adapted from FAO (2011a: 66).

In this regard, it is important to note that the direction of causality between poverty and land degradation is case-specific and often contested (Bryant 2008). Thus, instead of assigning soil degradation to poverty *per se*, it is documented that economically marginalized groups in countries with skewed land distribution have, historically, often been deprived of good quality land (cf. Deininger 2003). Such groups are further denied access to land through contemporary processes that Homer-Dixon (1999) terms 'ecological marginalization' (migration to ecologically fragile areas caused by inequities in resource access). Inequitable access to land by the different sexes further exacerbates this situation. Women face more severe challenges than men when it comes to the access, control and management of land-related resources (Agarwal 2003; Bose 2011; Colfer 2004).

Inequitable access to land poses serious challenges to the economic, social and ecological dimensions of sustainable development. Access to land is a core determinant of whether people move out of or into chronic poverty (Hulme and Shepherd 2003). With respect to the ecological dimension of sustainability, the recognition and security of land rights is a pivotal incentive for individual and community investments in land (Meinzen-Dick and di Gregorio 2004).

Land and soil is one of the policy arenas in which the introduction of progressive legislation contrasts starkly with its implementation in practice. Often, patterns of land distribution are not fundamentally altered despite the existence of progressive land policies. In the case of Brazil, the Gini Index of land distribution has increased from 0.857 in 1985 to 0.872 in 2006 (IGBE 2009). As another example: despite many land policies acknowledging women's rights to land, implementation is often lagging (FAO 2002). The challenge we are facing in how to govern the distribution of soil ecosystem services, is how to redress the power imbalances and overcome the vested interests of those benefitting from the status quo.

1.3 Coproduction of knowledge and cross-sectoral responses

Soil degradation, like other complex societal problems, has many facets that are often treated independently within various disciplinary sciences and more interdisciplinary fields such as land and soil governance research. Soil-related problems are presently often addressed as if they were disconnected from social causes, of which many are addressed by land governance scholars. Vice versa, in the contemporary discourse on land governance – with its strong focus on the political economy of land – there is often little reflection on the globally relevant soil functions and ways to govern them. Framing is of the essence! 'Protecting our soils' may be insufficiently attractive to those studying the multi-level nature of power structures related to land. At the same time, without a reasonable understanding of what 'healthy soils' entails, social science communities interested in studying the trade-offs related to actors and agencies may miss the specificities of the resource at stake. Overall, such exclusive framings limit the approaches to finding appropriate solutions for the soil-related challenges of sustainable development, such as the importance of healthy soils to produce sufficient food for a growing population. Therefore, several technological solutions to specific soil-related problems that emerged out of disciplinary research suffer from low adoption rates. Widely varying contextual factors also inhibit the adoption of technical and management measures. Therefore, in order to develop adaptive strategies to counteract soil degradation, there is a need to integrate different types of knowledge within soil and land governance regimes (Bisaro et al. 2011).

This goes beyond the call for interdisciplinarity. It is pivotal to acknowledge traditional and practical knowledge held by citizens and decision-takers in society (Pohl et al. 2010). Transformative knowledge needs to be co-generated by scientific and other societal actors. Transdisciplinarity, although an emerging approach to science, offers a promising approach for such co-generation of knowledge through joint definitions of problems and strategies and the pursuit of solutions. Such solutions are better accepted and have greater potential for effective implementation because they are achieved through co-generation resulting from a joint process and the deliberation of facts, interests and values by scientific and other societal actors (Hirsch Hadorn et al. 2006).

Fragmented governmental bureaucracies and their respective discourses often mirror the disconnection between related academic fields. While researchers

struggle to overcome rigid disciplinary barriers, bureaucrats have to establish cross-sectorial linkages. The departmental fragmentation or 'silo mentality' of government departments often leads to inefficiencies and the exacerbation of resource challenges (Ontario Cabinet Office 2000). Forest, water, soil and other resources are often governed in thematic isolation, where the different properties, such as quality and quantity are likewise managed by different administrative bodies. Administrative bodies often face weak or perverse incentives for interdepartmental cooperation (Sato 2011; Ontario Cabinet Office 2000). The actions and decisions of such agencies often oppose each other as a result of different priorities in target setting and budget allocation – a problem that frequently develops into interagency rivalries. Often, this organizational fragmentation leads to a slowing or even a complete stalemate in decision-making and managerial practice. The recent push for the establishment of networked, multi-level governance can be read as one reaction to these problems (Leach et al. 2010).

2. Sustainable Soil and Land Governance: From Attributes to Process

How to respond to these various challenges of soil and land governance in the nexus? The literature offers a rich variety of conceptualizations of environmental governance from local to global scales. This section outlines the evolution of paradigms to analyze governance of sustainability and especially of environmental sustainability. As a result of the objectives of sustainability and promoting social justice, the analysis of sustainability governance implies a normative premise in outlining ways in which environmental resources are governed. Therefore, this section later provides some normative insights emerging from the literature on the means of creating pathways for sustainability of environmental resources including soil and land. This brief review of a selected literature offers a framework to discuss the potential contribution of the Global Soil Week to land and soil governance.

2.1 Analytical and normative paradigms of sustainability governance

The simultaneous use of the terms government, governing and governance might sound convoluted and sometimes tautological. Adger and Jordan (2009: 10–14) differentiate between some features of the three terms and describe three prevalent distinctive discourses on governance, namely: the 'empirical phenomenon' as observed by the analysts; 'theory' of governance based on the theorization attempts made from generalizations of empirical patterns of governance; and a 'normative prescription' of governance, for example much more popular in the field of economic development. The emergence of the term 'governance' has close links to the shifts in real-world approaches to governing public affairs. The earlier considerations of 'monolithic' and 'homogenous' states as providers of public policy and equally homogeneous 'blocs' of civil society as recipients or resisters of state power (Anheier et al. 2002) characterized the top-down approaches to governing public affairs predominant until the 1980s (Leach et al. 2007). Gov-

ernance emerged as a critique and is a 'descriptive label' – to highlight the 'changing nature of policy processes', and demands consideration of all actors and locations beyond the 'core executive' involved in the process (Richards and Smith 2002). Leach et al. (2007: 34, 35) provide a useful overview which compares different approaches to governance noting the various interactions between actors in governance processes (see Table 2). For different contexts, a mixture of elements of each column may be appropriate to address governance challenges of sustainability (Leach et al. 2007).

	A: State-society-corporate politics	B: Networked governance	C: Adaptive, deliberative, reflexive governance
Entities and spaces	Distinct, bounded organisations and interest groups (states; international organisations, civil society/movement, corporation). Formal arenas and spaces.	Multiple actors, fuzzy boundaries, networked interactions across scales; multiple spaces (claimed, everyday, interstitial).	Shifting solidarities and interdependencies, institutions renegotiated through adaptation and deliberation; marginal, transient and inter-institutional spaces.
Emphases from social theory	Structures; formal rules and codes; relationships based on givens (e.g. sovereignty, assumed trust).	Actor-orientation; agency (e.g. of bureaucrats, citizens); informal rules and norms; structuration of institutions through practice; path-dependency.	Institutions, agency and relationships (re) negotiated through adaptation and deliberation.
Power and knowledge	Power as material political economy; sovereignty; centralised; competing political interests. Knowledge as 'truth speaks to power'; objective evidence and sound science; expertise constituted through official channels and hierarchies.	Power as dispersed (capillary) and operating through networks; power 'to' act as well as power over.	Power/knowledge as co-constituted through discourse; framings; multiple knowledges and forms of expertise including citizen and experiential; knowledge politics; co-construction of knowledge with institutions and governance processes.
Dealing with uncertainty	Plans and blueprints; assumptions of certainty and stability in social-technical-ecological systems; technical approach to risk.	Multiple interactions and contingencies in political process recognized as creating uncertainty in Governance processes and outcomes. Little attention to ecology/technology, dynamics and uncertainties.	Radical uncertainty due to social-technological-ecological dynamics (adaptive governance) and interaction of framings (reflexive governance). Learning, argumentation, deliberation.

Table 2: Different approaches to governance

Source: Leach et al. (2007: 34, 35).

The rejection of a gulf between state and civil society within policy processes opens up new space for investigating these processes, and necessitates the inclusion of multiple actors and their numerous interactions within the analytical frame. In practice, policy formulation and implementation are conducted by 'networks' of actors and institutions that are built around ministries and departments along particular policy areas (Leach et al. 2007). Such 'networked governance' has become a key to understand as well as prescribe governance mechanisms for management of environmental resources, especially in the developing world (ibid: 10). Environmental governance is defined as "...the establishment, reaffirmation or change of institutions to resolve conflicts (of interests) over environmental resources" (Paavola 2007: 94). The normative dimension of sustainability governance in interdependent systems of society and ecology requires coordination among different actors in changing to or sustaining institutions that regularize actions leading to sustainable outcomes (Elzen et al. 2005; Smith et al. 2005). The networks of multiple actors beyond the state and the market provide an opportunity to 'steer the coordination' towards achieving the agreed policy objectives (Leach et al. 2007: 9). The 'nested externalities at multiple scales' of various natural resource-related activities (Ostrom 2012: 354), and the overarching goal of sustainability further expand the space of policy processes involving multiple networks organized around multiple policy areas at multiple levels. Hence, networked governance emphasizes interlinkages of multiple actors both vertically (across multiple jurisdictional levels) and horizontally (across multiple sectors) for analyzing and achieving governance of environmental sustainability.

'Multi-level governance' is a widely applied concept similar to networked governance, for dealing with global environmental problems such as climate change whose occurrence and causes cut across local, national, regional and global levels. The multi-level approach highlights the concerns of complex interdependencies, overlapping jurisdictions and competencies across levels for governance (Pierre and Peters 2000). The basic characteristic of multi-level systems of governance is their inclusion and recognition of multiple public, private and community-based solutions at different jurisdictional scales. What results is an amalgam of a diverse set of governance institutions that often ensures the resilience and robustness of the complex resource system. Such institutional diversity is part of the solution towards adaptive governance (Ostrom et al. 1999: 278; Ostrom 2005). The multiple services that soils provide, and their spatial and temporal interdependences, require that the processes of governance are distributed across multiple jurisdictions and multiple sectors. In addition, other contextual attributes – such as those of the community, political system and economy – also characterize the challenges of governance (Ostrom 2009).

The adoption of 'networked' and 'multilevel' perspectives on governance facilitates the analysis of policy processes insofar as it includes multiple actors acting beyond the boundaries of state, private sphere and civil society. However, the complexity of processes of governance or policy is compounded by the informal dynamics embedded within state, private and civil society organizations. The 'realities of the bureaucratic politics' partly render the non-linearity and dynamic complexity of the policy processes, thereby increasing the difficulty of predicting policy outcomes and often also leading to their failure (Lindblom and Woodhouse 1993; Leach et al 2007: 9–10). Moreover, the broader conceptualization of civil society and community as an 'unequal and divided space' leaves their role in sustainability transitions ambivalent (Leach et al. 2007: 10). Relationships such as those based on power may, for example, reinforce social hierarchies. Such power relations shape – and are shaped by – patterns of institutional construction, consolidation and change (ibid: 15). Bardhan (2005: 27), for example, points to the "self-reinforcing mechanisms for the presence of socially sub-optimal institutions when path-dependent processes are at work". Hence, analysis of network-based governance, particularly in the more dynamic contexts of post-colonial and transition countries, must be combined with studies on historical patterns of institutional development.

Further, the multi-level or broadly networked governance approach falls short in understanding the interactions between the dynamics of ecological systems and such multi-actor governance systems; and in conceptualizing governance forms that can deal with these complexities (Leach et al. 2007). Thus, a third

way of thinking about governance comes into the picture: adaptive governance. Adaptive governance systems, which take into account the incompleteness of scientific information and the uncertainty of changes in ecological and social systems, are required for an adaptive management of complex systems (Dietz et al. 2003). Adaptive governance focuses on "...transformations within the social domain of the social-ecological systems (SES) that increase our capacity to learn from, respond to, and manage environmental feedback from dynamic ecological systems. (...) Transformations also include redirecting governance into restoring, sustaining, and developing the capacity of ecosystems to generate essential services" (Olsson et al. 2006: 2). Adaptive governance rests on 'polycentric institutions' (ibid), which Ostrom (2012) describes as "many elements (that) are capable of making mutual adjustments for ordering their relationships with one another within a general system of rules where each element acts with independence of other elements". Similarly to other global environmental resources, soils require governance solutions at multiple levels, operating at local, national, international and intermediate levels, with considerable independence between levels (Paavola 2007: 99).

One of the prime considerations of adaptive governance is the capacity of networks of actors for "flexible collaborative and learning-based approaches to managing ecosystems" (Leach et al. 2007: 26). It involves different phases: first, a perception of threat or problem and need for change in the management approaches; and a resulting second phase of transition to a "new social context for ecosystem management" (Olsson et al. 2006). However, adaptive governance thinking also has its limits. It assumes, prima facie, the uniformity of knowledge and interests across different actors thereby leading to production of common knowledge and shared goals, which are a precondition for adaptive governance of SES. It does not sufficiently consider the existence of multiple framings of issues or the contestations between them, leading to the dominance of 'accredited expertise' in the generation of knowledge and subsequent management approaches (Leach et al. 2007: 27). Besides ignoring the power and 'politics of knowledge' manifested in the multiple framings of issues and their interactions, adaptive governance has a biased focus on 'local scales', thereby rendering it weak in addressing the multi-scale ecological processes and their interdependencies (ibid).

The paradigms of sustainability governance discussed in this section provide significant contributions in understanding the intricate processes involved. Rather than arguing in favor or against a particular paradigm, this paper modestly aims to use the insights elaborated in different approaches to address the challenges of analysis and practice of soil and land governance.

2.2 Governance of sustainability pathways

We have seen that steering of transformation pathways towards sustainability requires coordinated efforts in co-generating knowledge, shaping common and shared goals and designing appropriate institutional arrangements. As Adger and Jordan (2009: 20) conclude, pathways to sustainability must be oriented towards both outcomes (social, ecological and economic dimensions) as well as *processes* (governing, guiding, participating and collective decision making). The focus on processes of achieving consensus – on understanding the problem and shared visions of outcomes as well as management strategies to achieve them – appears essential to meet the preconditions of adaptive governance. The approaches of 'reflexive' and 'deliberative' governance that embrace a 'constructivist perspective to knowledge' provide an understanding of how multiple framings of issues and pathways interact and may result in 'shared problem construction' as well as 'collective solutions' (Leach et al. 2007: 28 – 32).

By focusing on the different framings derived from various worldviews (Hajer and Wagenaar 2003), reflexive and deliberative approaches connect different forms of knowledge and framings to the social, political and cultural contexts in which they are produced. Yet another important contribution of such approaches is their consideration of dynamics and the inseparability of power and knowledge as constituents of 'discourse'. Studies on science show how knowledge–power networks are maintained by spreading and consolidation of 'knowledge claims'

(Latour 1999). While the process of knowledge production shapes the production and re-production of dominant scientific, social and policy positions (Jasanoff and Wynne 1997), these knowledge production processes are also limited by the same political processes. However, 'contestations over knowledge' have been "integral to power relations and struggles of social and environmental movements" (Leach et al. 2007: 21). We do not intend to argue in this paper that constructivist approaches are the only ones entailing a process dimension. However, they provide a suitable starting point for getting closer to transitions towards sustainability pathways for soils and land.

Several strategies have been recommended to advance adaptive reflexive and deliberative governance. Dietz et al. (2003: 1910), for example, mention several broad strategies for establishing an adaptive governance regime, such as an 'analytic deliberation' among scientists and all stakeholders, and 'layered' or 'nested' arrangements of multiple types of institutions. Voss et al. (2006) recommend, among others, integrated/transdisciplinary forms of knowledge generation and the use of iterative, participatory processes in goal formation. Specifically, to promote or practice deliberative governance, the recommended strategies include: facilitating interpretative interactions between different perspectives; reformulating the relationships between science, civil society and policy decision makers for better participation; and recasting the role of the 'expert' as a facilitator of public learning (Fischer 2003; Flyvbjerg 2001; Leach et al. 2007). Deliberative governance also offers scope for realizing the 'social justice' objective of sustainability governance by considering the contested frames of the problems and solutions. As Paavola (2007: 96 – 97) suggests, governance solutions – besides dealing with allocating entitlements to environmental resources and their benefits – must also ensure participation and provide for conflict resolution among different actors. Attention needs to be given to both distributive as well as procedural justice in order to ensure that the interests of all affected parties are sufficiently represented.

Many of the recent initiatives on global environmental governance have drawn inspiration from the recent literature reviewed above. Initiatives are currently being facilitated on the transdisciplinary production of knowledge; and on the continued and participatory dialogue among science, civil society and policy makers with regards to the challenges, management strategies and pathways to sustainability of natural resources (Hirsch Hadorn et al. 2006). It is crucial for these processes to analyze in retrospect, referring to the various principles of more appropriate forms of adaptive, reflexive and deliberative governance with a view to establishing and enduring the various pathways to environmental sustainability.

3. A Discussion of the Global Soil Week

In order to tackle the complex soil- and land-related challenges to sustainable development outlined above, soil and land governance needs to combine the principles of multi-level, networked, adaptive, reflexive and deliberative governance in a pragmatic way. The Global Soil Week aims to contribute to soil and land governance in this vein by offering a platform to bring stakeholders together. This transdisciplinary and participatory process is intended to contribute to new exchanges and alliances – both expected and unexpected. This shall contribute to a better understanding of the transformative governance that is needed, and also lead to insights into how to implement further steps in this direction. Therefore, the reflection on the Global Soil Week contributes to the scientific review of the concept of transdisciplinarity as it presents a real-world 'case study' worthy of reflection.

Following the design of this paper, this section discusses the ways through which the Global Soil Week aims to contribute to: (1) multi-level network governance; (2) adaptive governance; and (3) to reflexive and deliberative governance in order to achieve sustainable transformations of soil and land (see Figure 5 for a visual overview).

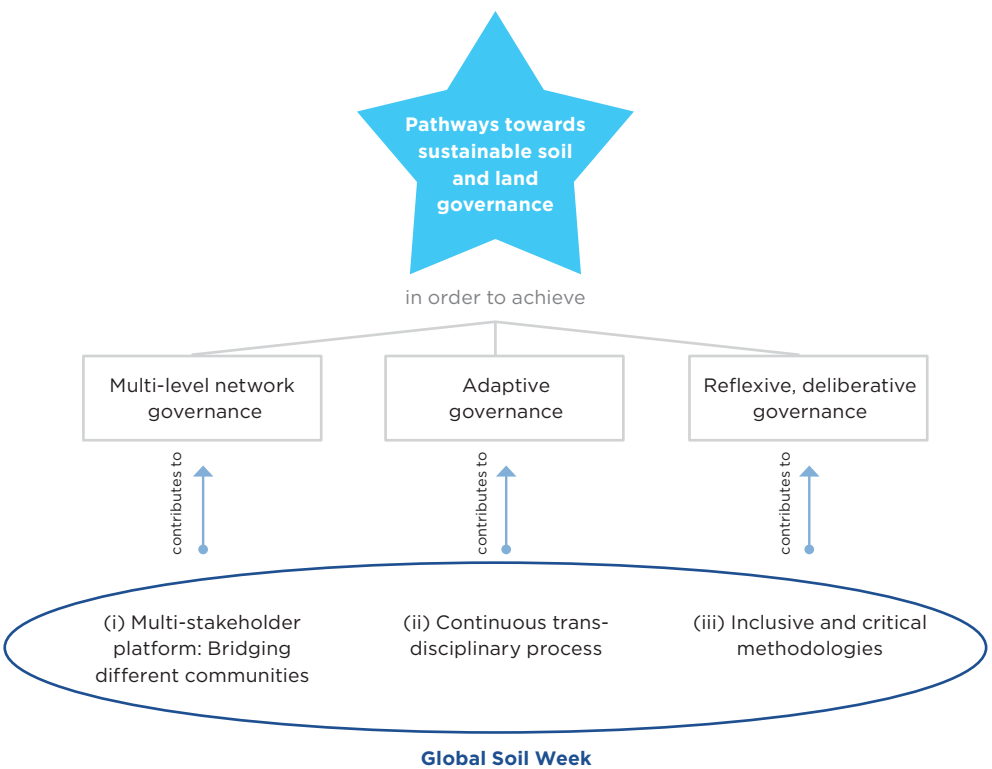

Figure 5: The contribution of the Global Soil Week to sustainable soil and land governance

Source: IASS Global Soil Forum.

(1) Multi-level network governance through a multi-stakeholder platform

Taking into account the challenges to land and soil governance outlined above, there seems to be an urgent need to strengthen multi-level network governance that is responsive to new insights co-produced between citizens, decision makers and scientists. The Global Soil Week intends to contribute to this multi-level network governance by establishing a multi-stakeholder platform that brings together diverse actors with different disciplinary, professional, cultural and regional backgrounds from different administrative levels, gender and age groups. This intention of creating space and time to bridge different communities of practice and thinking that do not necessarily interact on a day-to-day basis is reflected in the concept of transgovernance (in 't Veld 2011). The goal is to strengthen joint reflection and the co-generation of options for action among scientists and decision makers from government, civil society and business, which gain legitimacy through this joint process. This transdisciplinary process of knowledge generation does not, however, diminish the need for disciplinary studies or sectorial expertise and in-depth knowledge; it builds on this and calls for an interdisciplinary, cross-sectorial perspective on soil- and land-related challenges and an involvement of decision makers.

Besides bridging diverse communities and raising awareness among them, it is crucial to reach out to the wider public and involve classical as well as social media. This transdisciplinary approach strives to consider soils in a resource nexus, taking into account the multiple interactions between soils and the ecological and social systems. This nexus idea postulates that soils must be understood and managed in an integrated, holistic manner. In this regard, the multi-stakeholder platform aims to contribute to overcoming analytical and operative 'silo mentalities' in order to establish multi-level networks among diverse communities.

In concrete terms, the Global Soil Week is co-hosted by a network of partners: the Institute for Advanced Sustainability Studies (IASS), the European Commission, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Convention to Combat Desertification (UNCCD), the United Nations Environment Programme (UNEP), the German Federal Ministry for Economic Cooperation and Development (BMZ), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the German Federal Environment Agency (UBA). It is intended to be a recurrent multi-stakeholder platform to facilitate the exchange of knowledge and experiences among these different global initiatives and organizations and other stakeholders from government, civil society, science and business. Thus, the Global Soil Week has a focus on knowledge and is intended to complement inter-governmental regulatory processes under the auspices of the FAO or UNCCD.

This contribution occurs within an increasingly diverse landscape of soil and land governance. In addition to the UNCCD with its particular mandate to work in arid, semi-arid and dry sub-humid areas, there is now a range of more recent initiatives:

- In 2011, the FAO, with the support of the European Commission, founded the Global Soil Partnership (GSP) with the goal to improve global governance of soil resources in order to guarantee healthy and productive soils for food security, ecosystem service provision, poverty alleviation and climate change adaptation and mitigation (Montanarella and Vargas 2012). Since 2013, the GSP can count on the support of an Intergovernmental Technical Panel on Soils (ITPS).

- In 2012 the Committee on World Food Security (CFS) endorsed the 'Voluntary Guidelines on the Responsible Governance of Tenure of Land, Forests and Fisheries in the Context of National Food Security' (FAO 2012), emphasizing a rights-based approach to land governance. The CFS aims to be an inclusive international and intergovernmental platform for all stakeholders in order to jointly work in a coordinated manner to achieve food security and nutrition for all (FAO 2013).

- The Economics of Land Degradation (ELD) Initiative, which is driven by a broad partnership between scientific and political organizations, analyzes and provides economic justification for sustainable land management and a global approach for analysis of the economics of land degradation (ELD Initiative 2013).

- The CGIAR Research Program on Water, Land and Ecosystems (WLE) brings together an unconventional mix of partners, ranging from national research institutes to international NGOs, in order to examine how agricultural production can be intensified to ensure food and nutritional security as well as improve the livelihoods of rural poor while maintaining vital ecosystem functions of water, land and soil (CGIAR 2013).

These global initiatives, some of which are official partners of the Global Soil Week, remain indispensable actors at both the first and second Global Soil Week.

These initiatives cover crucial aspects of soils and land for sustainable development. There is also a clear need to scale-up these initiatives and for greater investment. However, to address the various soil- and land-related challenges to sustainable development, these initiatives need to be seen as elements in a broader context of governance for sustainability transformations of soils. Responding to the need to strengthen the network character of soil and land governance, the Global Soil Week facilitates the interaction between these global initiatives. To do so, the Institute for Advanced Sustainability Studies and its Global Soil Forum as the organizing unit of the Global Soil Week facilitates the continuation of these discussions held during the Week. This contributes to the process character of the Global Soil Week.

(2) Adaptive governance through a continuous, transdisciplinary process

In order to apply the approach of adaptive governance in practice, the Global Soil Week aims to establish a continuous, transdisciplinary process. The understanding required across epistemic communities and communities of practice and the evolution of transdisciplinary solutions are unlikely to occur during a single event. Rather, exchanges require time – in particular those across established communities. Drawing on the adaptive governance approach, the multi-level networks of scientists and decision makers need to strengthen their capacity for flexible and learning-based strategies in order to deal with complexities over time and space and the soil- and land-related uncertainties of socio-ecological systems (Leach et al. 2007). Therefore, the Global Soil Week aims to create a long-term exchange and learning experience between diverse stakeholders that goes beyond the recurrent platform meeting. It intends to allow for the joint development of strategies which take into account the incompleteness of scientific information and the uncertainty of changes in socio-ecological systems while aiming for greater robustness and resilience. In addition, the cultural diversity of the stakeholders builds resilience and helps in dealing with manifold tensions, dynamics and different values (in' t Veld 2011).

What does this process look like in practice? Two working groups emerged from the first Global Soil Week, which continued their exchange on specific topics linked to on-going political processes throughout the year via an open and collaborative process. They reconvene at the second Global Soil Week in 2013.

The first working group follows up on the Rio+20 Sustainable Development Conference, which launched a process to develop a set of sustainable development goals (SDGs) and put the ambitious agreement on the global political agenda to strive to achieve a land degradation neutral world (LDNW) in the context of sustainable development (UNGA 2012). This agreement sends a strong political signal that the world has to minimize land degradation and balance unavoidable land degradation by strict efforts on land restoration. In view of this on-going political process, and following-up on the discussions held at the first Global Soil Week 2012, the working group held a workshop at the Institute for Advanced Sustainability Studies (IASS) in order to discuss the role of soils and land within the post-2015 development agenda among relevant stakeholders from science, policy and NGOs. The group continued its work while involving further stakeholders in order to propose a set of illustrative targets and sub-targets of physical and socio-economic nature for a LDNW. The proposal will be presented and discussed at the Second Global Soil Week 2013 to continue the transdisciplinary exchange and involve additional decision makers in this on-going process.

The second group is working on translating principles of human rights-based land governance into practice, and specifically addresses the governance principle of transparency. The declaration of the G8 Summit 2013 at Lough Erne recognizes the importance of responsible land governance and puts the principle of transparency in this context. At the G8 Summit it was decided to form partnerships with African countries to increase the transparency of land-related investments. Before and after the G8 Summit, the IASS, together with the German Institute for Human Rights and the German Federal Ministry for Economic Cooperation and Development, hosted two expert hearings in order to discuss the German position and follow-up activities with experts from government, civil society and science. The participants emphasized that transparency is an important part of human rights-based land governance, but that it cannot be the sole solution for problems related to land governance. They expressed the need to deepen the exchange of knowledge and experiences, especially in relation to country partnerships on land transparency with international stakeholders. This will be done at the Second Global Soil Week 2013.

(3) Reflexive and deliberative governance through inclusive and critical methodologies

The approach of reflexive and deliberative governance emphasizes, among others, the need to be aware of and reflect on existing power relations and asymmetries. In the context of the Global Soil Week, it is therefore necessary to develop methodologies that allow for this reflection and that try to ensure inclusive and participatory processes. These methodologies need to allow for open exchange and dialogue on an equal footing, taking into account multiple framings and different value systems, interests and opinions. The Global Soil Week intends to encourage the diverse stakeholders to take ownership and to shape and co-create the process. For instance, stakeholders are involved in preparing and hosting sessions, in moderating and in reporting on outcomes of session discussions at plenary meetings. At the Global Soil Week 2012, about half of all participants had an active role such as a host, moderator, speaker or rapporteur. The Global Soil Week seeks to encourage the application of facilitation formats that contribute to inclusive processes.

The reflection on power dimensions reveals several important aspects of the Global Soil Week. So far, the official language of the Global Soil Week is English. Many stakeholders from the field of science, policy making, business and international NGOs are accustomed to working in English. However, many of those stakeholders who actually manage soil and land and directly depend on the resource for their livelihoods (e.g. farmers) often do not speak English and are hence excluded from this global initiative. Other factors of exclusion involve access to information about the Global Soil Week (e-communication) and the provision and access to funding resources. By explicitly funding stakeholders from non-OECD countries who have no access to other funding sources, the Global Soil Week tries to ensure the participation of otherwise financially excluded people. Further, knowledge discourses are often influenced by powerful actors who are able to make their voices heard. Hence, there is a need to reflect on the representation of different stakeholder groups from different regions at the Global Soil Week, and to make efforts to empower those whose voices are often ignored. As a first and necessary step, the diversity with regard to participants, speakers as well as within the international Steering Committee and the National Support Group of the Global Soil Week is constantly reviewed.

Overall, the Global Soil Week aims to encourage joint reflection to continue to develop methodologies that ensure participation on an equal footing and challenge existing power relations and dominant knowledge discourses. In this context, the Global Soil Week also builds on participants' reflexive capacity to continuously learn and adapt – a precondition for change. The concept of transgovernance emphasizes that changes to real-world configurations often come from inside, through intraventions – and not primarily from external interventions. In other words, people often live in different configurations and may thus transfer meaning between each other. Their multiple inclusions may hence function as a device for change and they become change agents themselves (in 't Veld 2011).

Conclusions

The Global Soil Week is an attempt to contribute to the sustainability governance of soil and land that blends the governance principles of multi-level, networked, adaptive, deliberative and reflexive governance. It serves as a platform for actors and organizations in soil and land governance to exchange experiences. Given the particular mandates of key organizations like the FAO and UNCCD, the Global Soil Week tries to foster synergies among the activities of these organizations to respond to the various soil- and land-related challenges to sustainable development. In this regard, it provides a platform for building new and innovative networks involving scientists, practical experts, government representatives and civil society in a transdisciplinary manner. These networks shall contribute to raising awareness of the importance of soils for sustainable development, for re-shaping and changing powerful existing discourses and for jointly developing pathways for change and implementation. This approach is fundamentally different from negotiations between states on sustainability issues because it primarily creates a space for cross-cutting discussions, joint learning and development of new insights and solutions. It builds on scientific research, the involvement of practitioners and on communication and open discussion. The Global Soil Week is also a work in progress and has to be continuously reviewed. Key questions for reflection are: how can a global initiative such as the Global Soil Week contribute to actual change to achieve sustainable transformations of soil and land? How does such an international processes gain traction at the national level and feed back into the necessary strategies for change in land and soil use?

In this regard a particularly pertinent question is how to systematically include local, bottom-up processes and to give equal representation to different stakeholders, including people 'on the ground'. One avenue would be to not only bring local processes to the global level but, in turn, to feed back global processes to the landscape level. There is a strong need to ground international discussions in concrete empirical insights from the ground. This allows for reflection on the dominant discourses and 'solutions' advocated by others. This reflexive process and 'analytic deliberation' (Dietz et al. 2003) needs to take place among a broad range of different stakeholders in order to ensure that the Global Soil Week contributes to sustainable soil and land governance. Taking these insights back to the global level would then contribute to new processes of knowledge co-generation.

Further, the Global Soil Week aims to develop new research questions and innovative understanding of governance. It is in itself a learning field that needs to be reflected on by diverse stakeholders and also from a scientific point of view. The concept of a 'knowledge democracy' (in 't Veld 2011) poses new questions on existing governance structures and calls for a reformulation of the relationship between science, government and public (Töpfer et al. 2013). The Global Soil Week therefore offers not only a platform for substantive discussions on how to achieve sustainability governance of soils: in addressing this daunting task, it also pioneers new ways of knowledge production and process governance.

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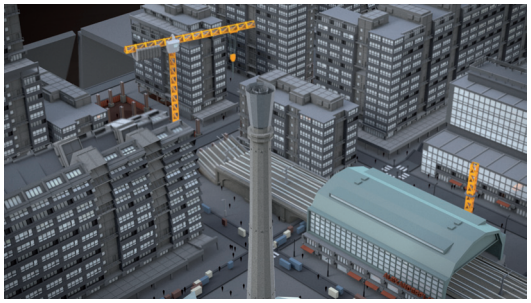
Figures

Tables

RAISING AWARENESS: THE IASS' ANIMATION FILM "LET'S TALK ABOUT SOIL"

The animation film "Let's Talk About Soil" illustrates that we all depend on soil in our everyday lives. It shows how various trends in global land use – from unsustainable agricultural practices to urban planning – will negatively impact on our livestyles if we do not act now. To support sustainable development, the film offers options on how we can manage our land more responsibly. The film is the winner of the animago Award 2013 for "Best Visualisation". It is available in English, Spanish, German, French, Turkish, Arabic and in English with subtitles. It was produced by the designer and animator Uli Henrik Streckenbach.



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