



Pathways to Collaborative Action

Transforming Agricultural, Land and Food Systems

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DEFINITIONS

Agricultural and Food Systems: The United Nations Food and Agriculture Organization defines the whole food system and commodity supply chain as including: agriculture, fisheries and animal feed production; the manufacturing of tractors, machinery, equipment, inorganic fertilizers and agri-chemicals; the building of infrastructure; post-harvest operations; food storage and processing; transport and distribution; and retail, preparation and consumption (FAO, 2011). While accepting this definition, the term ‘agricultural and food systems’ is used to emphasize that the focus is on more than agriculture production at the farm level. It is also on the rest of the food chain, including processing, marketing, retail, consumption, loss and waste of food beyond the farm.

Collaboration: Collaboration is a process in which autonomous actors interact through formal and informal negotiations, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions (Thomson and Perry, 2006).

Complex Systems: A system is a group of parts that function as a whole. Complex adaptive systems are dynamic, self-organizing and constantly adapting to change. They exist within other interdependent systems. They are driven by interactions between system components and governed by feedback. Changes in one part of the system can cause changes in other parts of the system, often in nonlinear and unpredictable ways (Best and Holmes, 2010 ; Ollhoff and Walcheski, 2002).

Cross-sectoral collaboration: Cross-sectoral action is an alternative to traditional modes of single, linear, siloed approaches (Dube et al., 2013). Cross-sectoral collaboration is not just multi-actor (e.g. private sector, non-profit, government, academia and community organizations), but also multi-sector (e.g. health, water, food, energy, environment) collaboration.

Governance: Is the process of decision-making and the process by which decisions are implemented (or not implemented). Dimensions of governance include: accountability, transparency, involvement, structure, effectiveness and power. According to the United Nations, national governance is considered “good” and “democratic” to the degree in which a country’s institutions and processes are transparent.

Integrated Landscape Management: Integrated landscape management involves strategic combinations of activities, investments, and policies by land and resource managers at multiple levels for multiple objectives, including food and fiber production, conservation of biodiversity and ecosystem services, and human wellbeing.

Nexus Thinking: Nexus means connection or linkages. In the context of land use, nexus thinking means taking a systemic approach to finding sustainable solutions to natural resource use and development, guided by an integrated view of the complex linkages and feedbacks involved (SEI International, 2012).

EXECUTIVE SUMMARY

We've all seen the statistics – the grim reality on the state of our planet and our agricultural and food systems. They are the kind of numbers that leave us with a dose of anxiety and a sense of urgency about how much needs to be done right now. But what seems clear and urgent on paper can quickly become muddled in reality. Inspiration gets replaced by frustration and what seemed like logical steps become mountainous obstacles in the face of resistance and apathy around us. Trying to fix the numbers, improve the system and shift humanity on to a more sustainable trajectory is hard and sometimes heart-breaking work.

This discussion paper seeks not to demotivate with more depressing statistics (although there will be some), but to inspire with the possibilities of taking cross-sectoral collaborative action to break away from business as usual – drawing on both theory and practical experience. Those that already have it figured out, and know exactly how and what they need to do to change the world probably don't need to keep reading. For the rest of us, a bit of inspiration and ideas on doing things differently can go a long way, especially when we know we need to act but are struggling to bring the rest of world along with us.

This paper starts with a review of the scale of the challenge, and then it looks briefly at what we already know we need to do. Examples are given to illustrate the complex non-linear linkages that exist between agriculture, land, food and other systems and sectors. The need for nexus thinking is highlighted. The concept of collaboration is introduced – both as a strategic capability and an opportunity to make progress in the face of complexity and uncertainty. The difference between collaboration and coordination is explained, and cross-sectoral collaboration is described.

Next, the question of 'how' to collaborate is addressed, delving into both theory and practice. Given the difficulties with ensuring collaboration is successful, options for improving the effectiveness of cross-sectoral collaborations are discussed. A range of issues are covered including structure, governance, institutional barriers, the need to create the space for innovation, the ability to manage conflict and compromise, and the time it takes to create trust among participants. The importance of having people with boundary spanning skills is emphasized, as is the need for better documentation of collaborative processes.

It is acknowledged that collaboration isn't a new invention and that there are already a lot of pioneering efforts to bring together different actors around the nexus of sustainable food and agricultural systems, some examples of which are given. Finally, pathways for scaling up collaborative action are considered, with suggestions for ways to further explore different approaches and a call for champions of the nexus approach to transform agricultural, food and land systems through greater (and more effective) collaboration. The key message is that the process of collaboration is as important as the outcome. This paper seeks to inspire others to collaborate and ensure they are better equipped to do so. The seeds of the future have already been sown. We just need to make them grow.

I. WHY DO WE NEED COLLABORATION?

This section explores several reasons collaboration is necessary. It reiterates the daunting scale of the task facing us. Examples are given to illustrate the complex non-linear linkages that exist at the nexus between agricultural, land, foods and other systems and sectors. This complexity challenges us not only to change the way we manage landscapes, but also how we think about them. The current sectoral, piecemeal approach is not working to get us to the scale we need. Collaboration is proposed as one way forward. The following sections will explain what, how (and when) to collaborate.

I.1 It's big

Around the world, there is growing recognition of the importance of sustainability and the need to take immediate and sustained action to transform our agricultural and food systems, particularly in the face of climate change. In countries everywhere organizations and individuals have mobilized to act. At the international level, significant effort and resources are being applied to the challenge. For environmental matters, more than 500 international environmental agreements have been concluded since 1972 (UNEP, 2012), covering issues such as hazardous wastes, climate change, biological diversity and desertification. For food and agriculture, there are international agreements on issues as diverse as plant genetic resources, plant protection, pesticide residues, foot and mouth disease, desert locusts, and illegal fishing. For agricultural trade liberalization, there are an increasing number of regional and bilateral trade agreements, with 193 regional trade agreements in force in 2010 (George and Serret, 2011).

The United Nations has established specialized agencies, funds and programs to deal with a broad range of issues across the sustainable development spectrum. The Global Environment Facility (GEF) – which serves as a financial mechanism for the three “Rio Conventions” of the United Nations, the Convention on Biological Diversity (CBD), the Framework Convention on Climate Change (UNFCCC), and the Convention to Combat Desertification (UNCCD) – has US\$4.25 billion in funding for the 2010-2014 period and is the largest funder of projects to improve the global environment. For financing programs on climate change, there are already over 20 funds (Schultz, 2012). The Green Climate Fund (GCF) alone has an objective of raising \$100 billion a year by 2020. There are also many other forums, funding bodies, intergovernmental organizations and not-for profit organizations active in the space. This is in addition to the activities of the private sector, research consortiums, government organizations, development banks and regional commissions that are also working in the field.

Despite all these organizations and some successes, there has been uneven progress, and the global environmental situation continues to deteriorate (UNEP, 2012). Why is achieving progress on sustainability so hard? Whether it is green growth, ecoagriculture, climate-smart agriculture or energy-smart food, there are numerous assessments, case studies, roadmaps, action agendas and strategies for sustainably providing food, energy, materials, and environmental services (Appendix I includes a summary of some of these recommendations, derived from McKenzie and Ashton (2012). *Box 1* summarizes some of the most common

suggestions, taken from a wide variety of sources). While differences in scope and objectives exist, there are areas of overlap.

Given we have policies, resources and plans for action, shouldn't there have been more progress? Institutional and political barriers are one part of the problem. In many forums, parties are resistant to commitments involving specific targets. Instead, aspirational goals result, with no specific responsibilities assigned. Within the UN complex, a fragmented system of rules is compounded by competition between agencies over funding, mechanisms and mandates. But these barriers aren't the only problem. Another key issue is scale. Current actions are simply dwarfed by the size of countervailing trends. For the billions of dollars being spent on sustainability, there are commercial transactions occurring at an order of magnitude beyond this level. The GEF might have a US\$1 billion dollar annual budget, but the world spends \$100 billion per year on chocolate confectionery alone (WCF, 2012). Compare this to the 2012 revenue for the global fast food restaurant industry – estimated to be \$500 billion (IBISWorld, 2013), or the 2011 value of agricultural product exports – \$1660 billion (WTO, 2012). It is true, consumers are starting to purchase certified agricultural products, but in 2008 they made up only 2.5% of the total food and beverage market value (TEEB, 2010). These are just figures for the food industry and don't take into account other drivers, such as fossil-fuel consumption subsidies – \$523 billion for 2011 alone (IEA, 2013). While there are already many agendas and recommendations, sustainability is a long way away. Something has to give – including a massive scaling-up of disparate efforts.

1.2 It's complicated

“We are now tied into multiple webs of interconnections never before witnessed in human history.” (Williams, 2012: 1)

Given the urgency and scale of the challenge, it is tempting to grab onto some high impact opportunities for change. But as anyone who has tried to work on sustainability will know, it is not that simple. Identifying simple solutions based on narrow sectoral analysis will rarely deliver answers across multiple systems. Complex non-linear linkages exist between food and agricultural systems and other systems, sectors and trends, including the global energy system, human-induced land use change, environment, health, biodiversity, water scarcity and climate change (Foley et al., 2011; Hamann et al., 2011; PBL, 2009). This makes the sustainability challenge complex in nature as well (Heuer, 2011). Considering these linkages in depth and figuring out the driving factors is not always easy. The following examples are included to further illustrate this point.

Shifting diets, reducing food waste and closing yield gaps

Foley (2011) suggests we could increase the global availability of food by 100-180% by implementing four actions simultaneously: stop expanding agriculture; close yield gaps; increase agricultural resource efficiency; and increase food delivery by shifting diets and reducing waste. Looking at the last point, “increasing food delivery by shifting diets and reducing waste,” what should be done? First, it must be reiterated that food waste is not only a developing country problem. Regionally, about 56% of total food loss and waste occurs in the developed world (North America, Oceania, Europe, and the industrialized Asian nations of China, Japan, and

BOX 1. RECOMMENDATIONS FOR SUSTAINABLY PROVIDING FOOD, ENERGY, MATERIALS, AND ENVIRONMENTAL SERVICES

For references and more information, see Appendix I.

Reduce resource intensity

- Increase resource use and energy efficiency throughout the supply chain
- Reduce loss and waste in food systems, particularly from infrastructure, farming practices, processing, distribution and household habits
- Reduce the use of cereals and fish in animal feed and develop alternatives to animal and fish feed
- Improve farm mechanization and post-harvest storage

Reshape food access and consumption patterns

- Establish reliable (and harmonized) certification systems to give people the choice to buy sustainably harvested products
- Strengthen supply chains for green products and farm inputs
- Value ecosystem services by ensuring that well-functioning markets provide the right signals to reflect the scarcity value of natural resources
- Align incentives to promote biodiversity conservation and sustainable use

Manage ecosystems within the limits of their functioning

- Adopt an integrated landscape approach to produce ecosystem services as well as agricultural products
- Restore degraded ecosystems
- Improve soil and water management
- Manage all sources of rainwater and runoff for multifunctional agroecosystems at river basin level

Support smallholders

- Support smallholder competitiveness through institutional innovations (e.g. farmer organizations' initiatives and collaborative landscape planning)
- Support smallholder transition to climate-smart agriculture through institutional and financial support
- Establish and enforce well defined property rights to help ensure optimal resource use
- Create alternative opportunities for rural employment outside agriculture
- Make sure smallholders have access to a fair price that reflects ecosystem values and functions

Innovate through science and technology

- Diversify crops and livestock - breed for a 2030 world
- Invest in plant and animal health management
- Improve the evidence base upon which decisions are made and develop metrics to assess progress
- Create comprehensive, shared, integrated information systems that encompass human and ecological dimensions
- Invest in research and development (R&D) to improve our knowledge of technologies, methodologies, as well as the conservation and production of suitable varieties and breeds
- Dedicate R&D resources to urban and peri-urban agriculture

Policy Reform

- Ensure cross-sectoral coordination and cooperation and greater consistency between agriculture, food security and climate change policy-making at local, national, regional and international levels
- Reform trade, price, and subsidy policies and reduce trade barriers
- Decrease the risk of highly volatile prices
- Regulate the price of commodities and larger cereal stocks
- Enact regulations to make sustainable production and consumption mandatory (e.g. ban illegal or unsustainable products, etc.)

Market Access

- Improve market access through improved infrastructure, product standards, better risk management and modern supply chains
- Enhance investment in sustainable agricultural production capacity and rural development

South Korea), whereas the developing world accounts for 44% of the loss (Lipinski et al., 2013). While actions to address food waste, such as improving storage for crops (via small metal silos, hermetically sealed plastic storage bags and plastic crates), will be important, policies to change food date labels to reduce consumer confusion about when food is unsafe could be just as effective (Lipinski et al., 2013). As Box 2 shows, issues such as food waste and energy use aren't necessarily confined to the farm or to developing countries.

Meanwhile, little progress has been made on "closing yield gaps." Average annual growth rates of yields (output per hectare) for grains have actually been slowing in both developed and developing countries since 1985 (Foresight, 2011). It now takes 2-3 times more fertilizers and 1.5 times more pesticides to produce 1 kilogram of food than it did 40 years ago (UNCTAD, 2010). In fact, in the past 50 years, global fertilizer use increased by 500%, while the production of pesticides increased by more than 850% (Balmford et al., 2005; Foley et al., 2011). And, every year there are 3-5 million cases of pesticide poisoning and over 40,000 deaths (UNEP, 2011). Many question whether the obsession with productivity and food security is actually compromising nutrition security.

In regard to shifting diets, piecemeal, sectoral approaches create problems as well. While under-nutrition is clearly an urgent food security challenge, especially for the 965 million people who suffer from it, obesity is also a serious problem. This is true for developed countries like Australia, where obesity is estimated to cost more than US\$56 billion per year. In the United States, obesity-related medical expenses are expected to top \$344 billion per year by 2018 (MODI, 2013). This is also a concern for developing countries. In fact, 80% of the deaths caused by obesity and non-communicable diseases (NCDs) such as diabetes and cancer occur in low- and middle-income countries (Dube et al., 2013). The majority of the world's population (65%)

BOX 2. BEYOND THE FARM GATE

In its recent report on agribusiness, the World Bank (2013: 2) wrote "it is not sufficient to focus solely on production agriculture," and that "production agriculture must be linked to agribusiness, broadly defined to include upstream and proximate downstream industries." This point is important not only when considering investment in the sector, but also when considering policy approaches for transforming agricultural and food systems. We must remember that the landscape is being shaped not only by farmers' decisions, but by decisions made through the supply chain from producer to consumer. In terms of the stages of the food value chain, 24% of global food loss and waste occurs at production, another 24% during handling and storage, and 35% at consumption (Lipinski et al., 2013). The amount of cropland used to grow this lost food is 198 million hectares per year, an area the size of Mexico. Just as more waste occurs at the consumer-end of the food chain, more energy is often used at the consumer-end as well. For example, in the United States, agricultural production uses less energy than downstream supply chain activities (Pelletier et al., 2011). Agricultural production, food processing and packaging accounts for approximately 14% of energy use, transportation and preparation account for about 5%, while cooking, cooling and freezing account for between 15 and 20%. The household is the largest consumer of energy, accounting for approximately 30% of the sector's energy use (including travel to purchase foods, storage in freezers/refrigerators, meal preparation and clean-up).

now live in countries where obesity kills more people than under-nutrition (WHO, 2013). Obesity affects more than 1 billion people and co-exists in the same societies suffering from under-nutrition and food insecurity (Kjaergard et al., 2013; Lang, 2006; MODI, 2013; Nellemann et al., 2009).

In developed and developing countries, societies are awash with cheap, highly processed, and nutrient-lacking “empty” calories (Carolan, 2013: 6). For example, in many small island states in the Pacific Ocean, nutrition security is being threatened by changing tastes, a growing dependence on store-bought foods, and the poor quality of cheap, imported, processed food and drinks, the control of which is complicated by trade agreements. In a great irony, even tinned fish is becoming a common import in small island states. (Connell, 2013). This transition from subsistence agriculture to a Western-type diet is occurring in countries around the world (Dube et al., 2013). Because it is happening in the space of a few decades, health systems have little time to shift gears from a focus on infectious diseases to non-communicable diseases as a key cause of death. Furthermore, while the health systems bear the cost, the levers of change for nutrition security lie largely outside of the sector’s reach (Dube et al., 2013). It is a challenge that does not fit neatly into the worldview or mandate of the agriculture and food sector either (Benson, 2012). Dependence on store-bought foods isn’t only a health concern, but also a security issue. Many urban areas are now dependent on globalized food production and distribution networks, with a supply of food and water that would support their population for several days at most in an emergency (Pelletier et al., 2011).

The increasing influence of a small number of companies in globalized markets for agriculture inputs, processing and retail, warrants greater attention. In theory, approximately 40 companies could transform the global agricultural sector through their endorsement and support of green and sustainable farming practices (see Acharya et al, 2011; Alexander et al, 2011; Burt et al., 2008 and Gagnon, 2012). However, the reality of the situation is a little more complex, and the involvement of the private sector is not a silver bullet. For example, the 11 multinational companies comprising the International Food and Beverage Alliance (who voluntarily committed to supporting the World Health Organization (WHO)’s 2004 Global Strategy on Diet, Physical Activity and Health) sell only about 10% of all packaged foods in developing countries. Therefore, even though IFBA companies set targets, such as reducing salt content in their food, this does not effect the majority of food consumed in developing countries, which is prepared at home or processed and sold informally (Yach, 2011). A more comprehensive strategy needs to involve global companies as well as small- and medium-sized local enterprises, government, non-government and development organizations, media, academia and community groups across food, energy, water, environment and health sectors.

Investing in agricultural production and rural development

Another recommendation, taken from *Box 1*, is to “enhance investment in sustainable agricultural production capacity and rural development.” This is a worthy goal, but its implementation can have unintended consequences. Take the example of Sub-Saharan Africa, where competing forces are shaping nations in unpredictable ways and many factors are affecting outcomes at the landscape level. From an agricultural production perspective, Africa is a continent that “holds more than half of the world’s unused fertile farm land, and impressive

but untapped water resources,” according to the World Bank (2013: vii). In fact, the World Bank projects that agriculture and agribusiness will expand to become a \$1 trillion industry in Sub-Saharan Africa by 2030 (compared to \$313 billion in 2010). Given the unprecedented interest of foreign investors and investment funds in African agriculture and agribusiness, such projections appear realistic. From an agricultural point of view, the fact that the demand for irrigated land is also projected to increase significantly in coming years (UNEP, 2009) would not be a cause for concern. But caution may emerge when considering water resources, especially given that two-thirds of global water supplies for irrigation are already drawn from underground aquifers at unsustainable rates (FAO, 2011).

Those taking a climate-change point of view might wonder how investment will be affected by the prediction that climate change will cause major crop losses in the world’s poorest regions (Kiers et al., 2008). Environmentalists might be concerned with the extent of global land degradation, a significant proportion of which is concentrated in Africa south of the equator (Bai et al., 2008). A health expert might be considering the linkages between illness, nutrition, water supply, sanitation and poverty (Zigliol et al., 2000). Those interested in forests would be thinking not only of commercial logging, but also the fact that agriculture is estimated to be the driver for around 80% of deforestation worldwide, directly impacting forest cover and carbon stocks (Kissinger et al., 2012). They might also be worried about the near-doubling (91%) of rural population between 1960 and 2000 and the ongoing use of wood for fuel and charcoal to meet household energy needs (Sampson et al., 2005). An energy expert would know that biomass is needed to meet basic energy requirements, given that Sub-Saharan Africa has the largest number of people (about 585 million) without electricity (OECD/IEA, 2011). Access to modern energy fuels will replace traditional biomass consumption for cooking, heating and lighting, although the length of time required for the transition to alternative energy sources is unknown (the shift from wood and water to coal as a main energy source took only decades in many developed countries at the end of the 1800s). From a development point of view, “access to energy is a necessary precondition to achieving many development goals that extend far beyond the energy sector – eradicating poverty, increasing food production, providing clean water, improving public health, enhancing education, creating economic opportunity and empowering women” (Sustainable Energy for All, 2012: 5). Thus, answering the original question, “how to best invest in sustainable agricultural production and rural development?” cannot be accomplished without considering the nexus.

1.3 It is the age of nexus thinking

Changing the way we manage land not only requires changing the way we live, but also changing the way we think. In a policy brief on the goal of zero net land degradation released before Rio+20, the UNCCD Executive Secretary Luc Gnacadja called for decisions on all land uses to be made “after the full consideration of options for synergies and trade-offs” (UNCCD, 2012: 3). This reflects a growing awareness of the interdependence and linkages between different sectors and systems that impact the land. It also reflects a new reality – that of shared dependency in an era when human demands for food, water, energy and land are rising (EcoAgriculture Partners, 2012). In other words, nexus thinking is a response to an era of resource scarcity and competition for the world’s finite natural resources, including land. Some refer to this idea as the “nexus,” suggesting that land is central to the “nexus” that links

energy, food, water and environmental health (PBL, 2009). Others seek to reframe thinking using a different lens, such as soil security, green economy, nutrient economy, nutrition security, nutrition sensitive landscapes, landscape approaches, etc. Whichever lens is chosen, it highlights the importance of looking across multiple perspectives and demands on land.

Nexus thinking is not new. There have been many conferences which have covered the interrelationships between sectors and systems much more comprehensively than will be possible in this discussion paper. See for example:

- Global Conference on Agriculture, Food Security and Climate Change (The Hague, 2010; Hanoi, 2012) www.afcconference.com
- Leveraging Agriculture for Improved Nutrition and Health (New Delhi, 2011) 2020conference.ifpri.info/publications/briefs/
- The Water, Energy and Food Security Nexus: Solutions for the Green Economy (Bonn, 2011) www.water-energy-food.org/en/conference.html
- The International Conference on Ecoagriculture (Nairobi, 2004) www.ecoagriculture.org/events.php?id=6

A key message is the need to identify synergies and trade-offs between the different sectors and across a range of objectives and a diversity of conditions.

2. WHAT IS COLLABORATION AND HOW DOES IT WORK?

The complex nature of agricultural and food systems creates the case for strong cross-sector collaboration (Googins and Rochlin, 2000; Heuer, 2011). Both the durability of decisions and the nature of human decision-making and behavior have implications for a nexus approach (Dube et al., 2013). While many people are aware of the need to collaborate, the capacity for collaborative action is often lacking. In other words, the challenge is figuring out both what collaboration looks like and how to collaborate. Then there is the task of finding the opportunities and resources to do so.

2.1 What is collaboration?

Some people view collaboration as the thing that happens when actors with similar self-interests work collectively. Others view it as something more than the sum of its parts where shared interests are achieved through mutual understanding and effort. In reality, collaboration is a bit of both.

Collaboration is more than coordination or cooperation. While coordination and cooperation can be elements of collaboration, the collaborative process is longer-term and more integrated. It involves a greater degree of interactions, commitment and complexity. The end goal of coordination may be to simply manage interactions and exchange information. For cooperation, the end goal is often sharing resources for mutual benefit. Collaboration includes all of these goals, and the goal of creating new information and enhancing overall capacity. Here, Thomson and Perry's (2006: 23) definition (citing Thomson, 2001) of collaboration is useful:

“Collaboration is a process in which autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions.”

Importantly, collaboration does not necessarily mean reaching consensus or agreement on the best possible solution. It means that participants support the decisions made within a collaborative process. Participants must therefore be confident in the process itself. On the plus side, for a complex predicament like sustainability, it seems that the more people understand the interconnected nature of a problem, the more they are likely to collaborate.

2.2 Cross-sectoral collaboration adds another layer

Cross-sectoral action is an alternative to traditional, single, linear, and siloed approaches (Dube et al., 2013). Cross-sectoral collaboration is not just multi-actor (e.g. private sector, non-profit, government, academia and community organizations), but also multi-sector (e.g. health, water, food, climate, land, energy, education, environment) collaboration. It is different from just having various stakeholders come together to work on a single issue – for example, companies, farmers and governments meeting to work on improving rice varieties. Cross-sectoral collaboration occurs when decision making and actions take place across system boundaries. While this might sound fairly reasonable, as many have experienced, in reality collaboration is more like Thomson and Perry’s (2006: 23) description of a “messy, contradictory, dynamic process that is defined by multiple view points and unintended consequences.”

2.3 How does collaboration work?

Many have walked into a collaborative process without really understanding what was occurring or how to evaluate the processes (Thomson and Perry, 2006). Although research on collaboration is still emerging, it is possible to define some of the ingredients of success. The following draws upon existing literature to provide a conceptual basis for better understanding the interactive process of collaboration.

Triggers – the situational context

Collaboration occurs within a multilayered context of political, legal, socioeconomic, environmental, and other drivers (Emerson et al., 2012). The more drivers present and recognized by participants, the more likely collaboration will be initiated. *Table 1* lists some of the common drivers of collaboration (Emerson et al., 2012; Thomson and Perry, 2006). Before establishing any collaborative effort, it is important to clarify why the collaboration is needed. It is not a panacea (there is such a thing as too much collaboration). Sometimes it is better not to collaborate, particularly if none of the drivers in *Table 1* are present. Coordination or cooperation might be all that is needed, rather than full-scale collaboration.

Establishment

In establishing a collaborative effort, a series of formal and informal interactions will take place. These may include reaching agreement, creating commitment and moving towards implementation.

<i>Table 1. Drivers of Collaboration</i>
Complexity
High levels of interdependence/network connectedness
Need for risk sharing
Resource conditions/scarcity
Previous history of efforts to collaborate
Situation in which each partner has resources that other partners need
Prior failure to address issues
Political dynamics/power relations
Policy/legal frameworks
Levels of conflict/trust

Agreement: Reaching an agreement involves a repetitive sequence of negotiations to achieve informal agreements (e.g. psychological contracts on composition, mission and process) and formal agreements (e.g. legal contracts on mandate, resources and decision-making structure) (Bryson et al., 2006; Thomson and Perry, 2006). In these negotiations, the mediation mechanism is not price or authority but an ongoing communicative process (Williams, 2012). Participatory drafting processes are an important part of this communication. A clear understanding of the goals, roles and action steps is likely to emerge over time as the network develops. Rather than beginning with a negotiation of difference, it can be better to begin with the identification of shared interests in terms of mission, commitment, target populations or professional orientation and culture (Thomson and Perry, 2006). Renegotiation and reassessment is advisable during the life of the collaboration.

Commitment: Commitments for future actions need to be developed (Thomson and Perry, 2006). In this case, planning is most likely to be successful where it builds on the different skills of different types of actors in the room (e.g. the private versus the public sector). Tapping into the unique resources (skills, expertise, money, etc.) that another party needs or could benefit from (and vice versa) also helps to achieve mutuality (i.e. mutual benefits). Mutual trust can be enhanced by being sensitive to the resource disparities of different partners and finding ways to respect, balance and manage these differences fairly.

Implementation: Commitments need to be executed through both organizational roles and personal interactions (Thomson and Perry, 2006, citing Ring and Van de Ven, 1994). Leadership roles need to be allocated fairly and fulfilled, including chairs, sponsors and champions. Participatory leadership that is not tied too closely to any particular organization is likely to be more successful than hierarchical leadership (Page, 2003).

Dimensions of collaborative process

Collaboration is not something that happens on its own; it requires nurturing and attending to the process from the start – not just as an afterthought. Box 3 provides a summary of some of the key dimensions of the collaborative process. This can be used as a conceptual checklist for designing or evaluating a collaborative process.

BOX 3. KEY DIMENSIONS OF COLLABORATIVE PROCESS

From Thomson and Perry (2006), Byrson et al. (2006), Emerson et al. (2012) and Dube et al. (2013)

Structure and Governance	Resources and Capacities
• Conflict resolution • Governance of behavior and relationships • Structures for reaching agreement on collaborative activities and goals (intra-organizational level and inter-organizational levels) • Administration (through appropriate coordination) • Leadership (e.g. convener, advocate, technical assistant, facilitator, funder, champion, sponsors) • Incentives	• Funding • Time • Technical and logistical support • Administrative and organizational assistance • Skills for analysis or implementation • Capacity to build relationships(e.g. boundary spanners) • Knowledge and competencies sharing • Pragmatic trust-building processes
Social Capital	Accountability and Transparency
• Mutual benefit • Mutual trust • Reciprocity • Mutual understanding • Internal legitimacy • Shared knowledge • Shared theory of action/ change	• Of inputs and outputs • Of processes • Results-based accountability • Partner accountability • Performance consequences

Outcomes of collaboration

Collaboration can deliver many outcomes, often greater than the sum of its parts and beyond the expectations of the original convenors. Many of the global sustainability challenges we face will not be met without it. When thinking about outcomes for monitoring and reporting on a collaborative effort, consider the following checklist of possible direct and indirect impacts:

- Achievement of goals
- Creation of new institutions and/or changing inter-organizational culture
- Development of innovative strategies
- Adoption of new modes of discourse
- Creation of shared meaning
- Redistribution of power
- Establishment of self-governing partnerships, coordination, joint-learning and joint-action
- Creation of capacity to leverage resources and create results on the ground
- Creation of social, intellectual, and political capital
- Establishment (and implementation) of high-quality agreements
- Increase in interactions, especially more mutual growth and less destructive conflict among partners
- Transformation of transactions among organization into socially-embedded relationships, new norms and social heuristics for addressing public problems
- Changes in the pre-existing or projected conditions of the system

3. EXAMPLES OF EXISTING CROSS-SECTORAL INITIATIVES

Many people have pioneered efforts to bring together different actors around the nexus of sustainable food and agricultural systems. It is not possible to cover all of the initiatives, but the following short examples show some that are currently active. Each initiative has a different lead organization and overarching objective. All are seeking to achieve more sustainable outcomes for how humans use land, and all cut across multiple sectors. The Global Land Tool Network and the United Nations Reduced Emissions for Deforestation and Forest Degradations (UN-REDD) programs are both global initiatives led by United Nations agencies. The Landscapes for People, Food, and Nature Initiative (LPFN) and Solutions from the Land (SFL) are both led by not-for-profit organizations. The Tropical Forest Alliance 2020 is a global public-private partnership. The work led by the United Nations Convention to Combat Desertification (UNCCD) on a Land Degradation Neutral World and the United Nations Food and Agriculture Organization (FAO)'s SAVE FOOD Global Initiative on Food Losses and Waste Reduction are other examples. There are also many regional and local programs not considered here. The following five examples were chosen to illustrate progress that has occurred and momentum on which to build.

3.1 Global Land Tool Network (GLTN)

The GLTN is a collaborative initiative built around a global partnership on poverty and land. With a secretariat located within UN-HABITAT, it brings together international networks of civil society, international finance institutions, international research and training institutions, donors and professional bodies as well as many individual members. The GLTN is focused on poverty alleviation but takes a cross-sectoral approach that incorporates issues such as: access to land and tenure security; land management and planning; land administration and information; land-based financing; land policy and legislation; capacity development, land governance; youth; land in the Muslim world; human rights; food security; conflict/disaster; environment; and gender. Due to their objective of taking a more holistic approach at a global level to land issues, this initiative requires a collaborative approach. The network seeks to improve global coordination on land; establish a continuum of land rights (rather than just focus on individual land titling); improve and develop pro-poor land management; unblock existing initiatives; assist in strengthening existing land networks; and improve the general dissemination of knowledge about how to implement security of tenure. In particular, different members have collaborated to develop tools on land tenure, gender and food security that are affordable and useful at the grassroots level. More information on GLTN can be found at www.gltn.net.

3.2 Landscapes for People, Food, and Nature Initiative (LPFN)

The Landscapes for People, Food and Nature Initiative is a collaborative research, practitioner support, knowledge-sharing and advocacy partnership. It has a cross-sectoral focus at the landscape scale, with participants from around the world. The initiative is facilitated by EcoAgriculture Partners and co-organizers from leading international institutions: Bioversity International, Conservation International, the Food and Agriculture Organization of the United Nations, the International Fund for Agricultural Development, the Dutch Ministry of Economic

Affairs, the United Nations Environment Program, the World Agroforestry Centre, and World Resources Institute. The Initiative consists of three integrated components: 1) A Global Review of the evidence base for ecoagriculture from diverse disciplinary and sectoral perspectives; 2) A multi-stakeholder dialogue, which brings together innovators engaged in applying and promoting integrated landscape approaches; and 3) Action and advocacy to implement these agendas at the landscape level through collaboration among a wide range of stakeholders (e.g., farmers, governments, NGOs, donors and the private sector), as well as at national and international levels. More information can be found at landscapes.ecoagriculture.org.

3.3 Solutions from the Land (SFL)

SFL is a national initiative in the United States launched in 2009 to open a dialogue between farmers, ranchers, foresters, policy makers, NGOs, and the private sector in an effort to build a new vision for agriculture, forestry, and conservation. With land based challenges as the central focus, the SFL Dialogue brings together multiple perspectives and sectors. Discussions among members led to the publication of The Pathways Report in early 2013, which examines land-based challenges in the future, considers ways to galvanize interest in these challenges, and offers optional approaches to serve as the basis for the Dialogue. SFL has several working groups on topics including: policies to extend services from the land; research, development, knowledge sharing; markets to generate solutions from the land; and monitoring progress and measuring success. More information on SFL can be found at www.sfldialogue.net.

3.4 Tropical Forest Alliance 2020 (TFA 2020)

TFA 2020 is a global public-private partnership with the goal of reducing tropical deforestation associated with key global commodities such as palm oil, soy, beef, paper and pulp. It is a result of a partnership with the Consumer Goods Forum (400 companies, annual sales more than \$3 trillion) and the U.S. Government. Current TFA 2020 membership includes the Consumer Goods Forum and the governments of the United States, Netherlands, Norway and the United Kingdom. Civil society has also been invited to join. Collaboration is an essential part of TFA 2020, given that its goal is to contribute to mobilizing and coordinating actions by governments, the private sector, and civil society to reduce tropical deforestation related to key agricultural commodities by 2020. TFA 2020 is not a regulatory body, nor will it create or endorse specific certification standards or verification services. Rather, TFA 2020 partners will work together to provide expertise and knowledge, share best practices and improve planning and management related to tropical forest conservation, agricultural land use, and land tenure. More information on TFA 2020 can be found at www.usaid.gov/climate/tfa2020.

3.5 United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD)

The UN-REDD Program was launched in 2008. It is an international program that supports nationally-led REDD+ processes and promotes the informed and meaningful involvement of all stakeholders, including indigenous peoples and other forest-dependent communities, in REDD+ implementation. With deforestation and forest degradation both issues that cut across many sectors, including forestry, agriculture, energy and food, UN-REDD must work with many

different organizations and individuals to achieve its goals. The UN-REDD Program supports 47 countries across Africa, Asia-Pacific and Latin America and the Caribbean. Headquartered in Geneva, Switzerland, UN-REDD regional teams operate in all of these areas to help coordinate efforts across countries in the region and to liaise with teams in other regions. UN-REDD currently has US\$172.4 million in funding, and a secretariat supported by Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Program (UNDP) and the United Nations Environment Program (UNEP). Its 2011-2015 Strategy Document (UN-REDD, 2011) identified early lessons learned related to a range of matters, including the importance of: building trust and capacity through early stakeholder engagement; ensuring a solid governance structure for country level efforts; and cross-sectoral coordination across the multiple government agencies, ministries and sub-national government agencies that may have responsibility on some aspects of the process. More information on UN-REDD can be found at www.un-redd.org.

3.6 Areas requiring further collaboration

While acknowledging that collaborative efforts exist, it is also recognized that there are still areas for further work, at a greater scale. Collaboration is still needed around both solution-specific approaches (for example, on 'land wedges' like food waste or degraded lands) and geographically-specific approaches (for example, across sectors within a region). There is also the opportunity to apply the lessons from collaborative approaches to the framing of the Post-2015 Sustainable Development Goal (SDG) discussions.

4. HOW CAN WE MAKE CROSS-SECTORAL COLLABORATION MORE EFFECTIVE?

Collaboration is transient and fragile, and places significant time and energy demands on participating actors. This is why it has been subject to a high rate of failure (Williams, 2012). In reviewing the literature, it becomes clear that there are some common pitfalls that, if avoided, can help reduce the risks. The following recommendations are not all easy to implement, but if they can be incorporated into design from the start, they might help ensure a smoother journey.

4.1 Structure governance appropriately

It is important to realize that cross-sectoral collaboration is generally emergent and therefore requires flexible and adaptive governance structures that can work across multiple levels and systems (Heuer, 2011). This means that the structure will be less hierarchical and more complex and fluid than those found in traditional bureaucracies (Emerson et al., 2012). It also means that traditional modes of coordination and hierarchical governance focused on single issues may be a poor match in the face of complexity and uncertainty. Concepts of 'network management' may be more appropriate, where governance involves social mechanisms to coordinate and monitor activities.

At its simplest, a network comprises the relationships among pairs of actors. Networks help us to understand how information flows, communication and information processing take place

within a social system. Drahos et al (2005) have elaborated on network theory with concepts of nodal governance. They use this to explain how actors interact along networks. They define a node as a site of governance where knowledge (mentalities), capacity (technologies) and resources are mobilized (through structures/institutions) to manage a course of events. Robins et al. (2011) suggest that an effective governance network system would require the presence or the emergence of at least the following: 1) network structures that can facilitate effective coordination of action, the development of trust, and team-like collaboration; 2) agreement among network actors about goals and actions; and 3) specific goals and actions that are adequate to address the broader intent of the governance system.

The challenge with networks is that building legitimacy can be difficult when there is no clear organization in charge. It is therefore important to create support for the network as a valid entity as well as a means of interaction (Bryson et al., 2006). Lack of flexibility can be more of a threat than if the governance and structure of the collaboration changes over time. This is because collaborations will be more durable if they can reframe after success (or failure) and adapt to changes in context and collaborative dynamics as they arise (Emerson et al., 2012).

4.2 Recognize institutional barriers

Cross sector collaborations are affected by competing institutional logics including normative, legal and regulatory elements. Different organizations may have different logics to conform to, while the collaboration may have another logic altogether. The individuals within the collaborative effort are the ones who need to negotiate these mismatches (Bryson et al., 2006). Around the world, from the United Nations to national governments to local councils, governmental agencies are encumbered with administrative bureaucracies that are relatively complex, competing, outdated, and often overlapping (Heuer, 2011). This leads to common obstacles to cross-sectoral action across government sectors (Benson, 2012). These include:

- The different worldviews and mandates of sectors
- The resource allocation and planning processes within government
- Capacity constraints within sectors for generating necessary information

Such obstacles not only complicate efforts to collaborate within government, but also the relationships between the government and other sectors. In expert consultations for the preparation of this paper, issues with mandate and resourcing were raised numerous times. Part of the problem with financing is that cross-sectoral efforts may not fit neatly into the core of any single sector or agency, and therefore may struggle to win a slice of the funding pie. The reality is that it can be more pragmatic to link collaborative efforts to existing programmatic action, rather than to try to create a new project or funding stream. Unfortunately, this also means that collaborative efforts often remain constrained within existing structures. If this is a driver of the structure of a collaboration effort, it should be recognized and managed.

4.3 Foster participatory leadership

Participatory leadership requires focusing on collective, dynamic priorities for change, supporting different ways of conceptualizing challenges, and developing information sharing networks within and across organizations. It is about generating a shared understanding of

what is effective and what is not in the real world, and where the best place to move forward might be. This is about more than ‘workshop’ facilitation or face-to-face meetings. There is a common misperception that a well-designed workshop alone can create the conditions for participation and collaboration. Creating the conditions for participation requires conscious design and attention to social process long before any event occurs. Ensuring that participants in a collaborative effort are truly engaged when meeting face-to-face is an important step, but it is only one step in a longer process of engagement and emergence. To this end, a range of participatory processes can be utilized. Different methods can be woven together to suit the needs of the process. These methods are largely ‘dialogue-based.’ That is, dialogue and generative conversation are the essential vehicles for enabling people to begin to operate from a future space of possibility that they feel wants to emerge. Examples of these methods include Theory U, Appreciative Inquiry, The Circle, World Café, Open Space Technology, and Pro Action Café.

For an informative overview of these approaches and participatory processes, refer to the participatory process design guide, *The Weave: Participatory Process Design Guide for Strategic Sustainable Development* (Meisterheim et al., 2011). For more information on Theory U, see *Theory U: Leading from the Future as it Emerges*, where Scharmer (2007) observes that, at its core, leadership is about shaping and shifting how individuals and groups attend to and subsequently respond to a situation. What we pay attention to and how we pay attention – both individually and collectively – are keys to what we create. *Arts of the Wise Leader* is another good resource in which Strom (2007) makes a useful distinction between communication, which tends to be about sharing meaning or knowledge, and conversation, which is about creating meaning through interpersonal relationships (see Figure 1, from Strom 2007).

4.4 Take the time to build common intent

People from different sectors will each bring a unique and different perspective on the nexus. They will likely also bring different experiences to the table and different conceptual frameworks for understanding how the world works. This means that when collaborating across sectors, it is important to take the time to stop and listen to each other and to build common intent. This is not necessarily about agreeing on the same worldview, but in building a shared purpose. This is an important first step in any cross-sectoral collaboration. The



Figure 1. Communication versus conversation, from Strom, 2007: 8 and 27.

authors mentioned above provide some guidance on how to facilitate such conversations. In Scharmer's Theory U (2007), he calls these first steps co-initiating and co-sensing. While we are often skilled at coming up with new ideas or pursuing a particular vision, often we are poorly equipped to work together to collectively 'see' the system. Co-sensing the system requires participants to suspend their judgment. They need to resist defending their existing thinking, or else debate rather than true dialogue will arise. This is not about deciding who is right or who is wrong. If one person could 'see' and master the whole system, there would not be a need for collaboration. Each person brings a piece of the puzzle to unlock a collective new understanding and the potential for synergies and trade-offs. Suspending judgment and being open to letting go of embedded patterns of thinking and seeing is at the heart of reflective and generative dialogue. Such dialogue is crucial in reaching new understandings of complex systems, in creating shared meaning and in aligning intention and action. It is with this new understanding that groups can work together to co-create new ways of acting and transforming the system.

4.5 Pay attention to conflict and compromise

We wear two hats coming into a collaborative process – our usual personal and / or institutional hat and our collaborative hat. This means there is a constant tension between individual and collective interests (Thomson and Perry, 2006). It is natural for there to be conflict when there are a diversity of actors assembled, each with different interpretations and influences (Sullivan et al., 2012). However, this can be exacerbated when parties are unwilling to negotiate, forge commonalities out of difference and satisfy differing interests without loss to the whole. Partners need to go into the collaborative effort prepared to meet collective interests. It can help if the parties are sensitive to each other's (individual and organizational) goals and willing to reach a mutual understanding of alternative perspectives (as distinct from a shared understanding or identical view). If conflict cannot be actively managed, it may be necessary to reframe the goals and meanings of the collaboration (Bryson et al., 2006; Thomson and Perry, 2006). If it can be managed, this is when collaboration can be its most powerful because actors with unaligned or conflicting interests still chose to collaborate to achieve a common goal or solve a shared problem.

4.6 Allow time for trust to emerge

If there is one key ingredient in collaboration, it is trust. There can be no collaboration without it. Reciprocity can be built in the short term through the equal sharing of costs and benefits. However, building trust takes longer. At the individual level, trust links to reputation and confidence in someone's reliability. Individuals need to know that others will act in good-faith, be honest in negotiations and not take advantage of each other. This means building personal relationships. When trust exists in a personal relationship, formal legal contracts can be replaced by informal psychological contracts. Emerson et al. (2012) propose that repeated, quality interactions through principled engagement (interactive processes of discovery, definition, deliberation, and determination) will help to foster trust, mutual understanding, internal legitimacy, and shared commitment, thereby generating and sustaining shared motivation. At the organizational level, trust is needed from the organization that the process and the role of their representative are appropriate. This is because individuals are negotiating

and collaborating on behalf of organizations, and they need the authority to do so. There also needs to be an ongoing commitment from the organization, not just the individual. Otherwise, when the staff moves on to new roles, the trust is lost with the personal relationship. Between organizations, distrust can be created by power inequities because one organization knows or fears that a more powerful partner won't reciprocate or may act in bad faith and that they are not in a position to correct this. It can also arise if partners perceive a threat to their own autonomy. To mitigate this, trust in the collaborative process itself needs to be built.

4.7 Appeal to the motivations of participants

In designing a collaborative process, discovering or uncovering the motivations of participants often proves useful. In analysis by Fleishman (2009), the following factors were found to rank the highest in terms of motivating participants to take part:

- Access to useful information
- Being part of a network
- Working with other organisations that share similar goals
- Financial resources
- Technical expertise

More indirect benefits such as influencing policy and promoting the organizations to funders were also on the list, but ranked lower. Avoid demotivating factors such as:

- Burdensome reporting requirements
- Inability to achieve policy goals
- Inconvenient meeting locations and times

4.8 Value social capital

In moving from decision to action, our behavior is influenced not only by our intentions and motivations, but by the availability of requisite opportunities and resources (e.g. time, money, skills and cooperation of others) over which we can have limited control (Ajzen, 1991). This 'context of opportunity' (Sarver Jr, 1983) is important, in that it is not enough to want to act – we also need the capacity to do so. Creating the opportunity and capacity is important. In particular, a degree of social, intellectual, and political capital is necessary to kick start the process. This capital can be renewed in a virtuous cycle of self-reinforcing interactions, but it takes time and effort (Emerson et al., 2012). Eventually a new capacity for joint action should arise (the whole point of collaboration). However, the requisite capabilities – especially time and effort – are not always recognized in traditional performance metrics within a workplace. More often than not, participation is an additional task for an individual beyond their 'day job.' This doubles the time cost because time is spent participating, plus time is 'lost' to usual daily tasks. If organizations are serious about collaboration then they need to recognize and reward the time and commitment of individuals involved. Given cross-sector collaboration requires decision-making and actions to occur across boundaries, organizations need to encourage boundary-crossing activities – behaviors which are too often blocked by significant professional,

organizational, sectoral and other barriers (Sullivan et al., 2012). On the flip side, staff should be held accountable for achieving specific goals, with performance linked to consequences (Page, 2003).

4.9 Install boundary spanners

Humans have evolved administrative structures that are largely dependent on sectoral specialization. This is not necessarily a bad thing as it provides a depth of expertise in many important areas. However, it should not mean neglecting cross-sectoral and multi-disciplinary decision-making abilities. One solution is to ensure that adequate attention is paid to the role of ‘boundary spanners,’ an often unrecognized and undervalued skill that can be crucial to success (Williams, 2012). Boundary spanners are managers and leaders operating within areanas requiring collaborative management. Their challenge is to balance their responsibilities within formally prescribed positions inside an organisation against those as representatives in forms of collaboration. They need to be able to cope with ongoing sources of tension, paradox and ambiguity. It remains a question whether we need more dedicated boundary spanners in the system, whether we need to develop the boundary spanning capabilities of more actors, or whether we need to build more organisations that value this role. It is clear that greater recognition of the ability to successfully collaborate is needed. It is an important strategic capability, not a distraction or drain on resources (Heuer, 2011).

4.10 Remember that we are only human

There is a reason for the saying “I am only human.” We are a curious species with many quirks and strange habits. The same humans who have trouble deciding what to eat for dinner, what to wear, or how to invest their savings, are also the ones who go to work each day to run the international policy system. Humans are not fully rational (not even in some economic models). We are not necessarily irrational either, but we make decisions within constraints of certainty, time and resources and subject to an individual’s cognitive ability to process information (Chavas, 2008). This is what Simon (1955), referred to as “approximate” or bounded rationality. We make decisions the best we can, given our bounded rationality. We are all influenced by social norms, peer pressure, how we conform or compare with others. We adopt strategies for making decisions based on the number and complexity of options available. We simplify where we can. Humans are subject to all sorts of decision traps (see Box 4).

BOX 4. DECISION TRAPS

From Raiffa et al.’s 2002 *Negotiation Analysis: The Science and Art of Collaborative Decision Making* (see Chapter 3 on Behavioural Decision Theory).

- Anchoring Trap (being unduly influenced by first impressions)
- Sunk-Cost Trap (trying to recoup losses)
- Status Quo Trap (unduly sticking with the past)
- Confirming Experience Trap (seeing what you want to see)
- Framing Trap (solving the wrong problem or being unduly influenced by the way the question is posed)

When it comes to uncertainty, these traps can be even more pronounced, and the lack of feedback can make it hard to learn. Rethinking first responses based on an awareness of these traps can be one way to avoid them. (For more on mental glitches and the dual processes of logic and intuition that drive the way we think, see also Kahneman's (2011) book *Thinking, Fast and Slow*.) When it comes to group decision-making, there are a range of academic fields of inquiry, from decision analysis and behavioral decision-making to game theory and negotiation analysis (Raiffa et al., 2002). While it is not possible to address the details of group decision-making here, it can have different characteristics from individual decision-making. These different characteristics are what inform the design of collaborative efforts.

4.1.1 Incentivize innovation and collaboration

Given our bounded rationality, it is important to consider concepts such as Nudge Theory. Nudge Theory argues that positive reinforcement and indirect suggestions can be at least as effective -- if not more effective -- than direct instruction, legislation, or enforcement in influencing the motives, incentives, decision-making, and actions of groups and individuals alike (Thaler and Sunstein, 2008). A nudge can be anything that influences decisions. A classic example is the beeping a car makes when the seatbelt is not plugged in, or the design of aisles in a supermarket. Nudges influence our choices every day. A key part of nudging is changing the default option so that 'opting in' is automatic and 'opting out' requires effort (rather than the other way around). How many cues within an organization inadvertently nudge individuals away from collaboration or innovation?

To encourage innovation in the context of cross-sectoral collaboration, Galaz et al. (2012) suggest creating 'space for innovation' and 'transition arenas' that bring together networks of diverse actors to develop a shared understanding of how they collectively can influence dysfunctional and path-dependent systems, such as water and waste management and energy supply. Such informal networks might be a positive first step in encouraging entrepreneurship and innovation in institutions. They might also help encourage more formal avenues for collaboration, a break away from existing structures, and the redirection of nudges within organizations.

4.1.2 Set clear boundaries

It is important to be both realistic as well as ambitious. While our goals can be lofty, they need to be grounded in strong frameworks and clear boundaries. Setting boundaries is important not only for managing expectations, but for ensuring effectiveness. In a review of six cross-sectoral collaborations in Southern Africa, Rein and Stott (2008) concluded that establishing clear boundaries in any partnership (as well as principles for working together and systems of communication) is important, not only for functional purposes, but also to maintain trust and facilitate conflict resolution when required. And while exit strategies and definitive timelines are not necessarily required, planning ahead pays off.

4.1.3 Document processes

Learning from existing and past efforts is complicated by the lack of documentation and reporting on actual processes and procedures. While reports detailing actions and outcomes

are prepared to satisfy funding requirements, time and resource constraints often mean that processes are not documented. Process documentation doesn't have to be complicated or even a formal part of evaluation. But if we are to learn from experience, then greater attention to process is needed. A draft template for documenting collaboration is included in *Appendix 2*. Users might wish to modify it to suit their own project needs. They may also wish to explore alternative evaluation techniques that are more suited to non-linear processes than some of the traditional frameworks available. On this note, more work is still needed on identifying appropriate metrics for complex collaboration (Dube et al., 2013).

5. PATHWAYS FOR SCALING COLLABORATIVE ACTION IN AGRICULTURAL, LAND AND FOOD SYSTEMS

After reading about all that is required for successful collaboration, not to mention the doomed or unconvincing attempts at collaboration in which many have participated in the past, it may seem like collaboration is too troublesome to bother with. Indeed, collaboration is messy and not something that should be attempted without forethought. But when done right, it can be well worth the effort. And as stated above, many of the global sustainability challenges we face will not be met without it.

This paper has explained some of the key components of the collaborative process, particularly in relation to structure and governance, resources and capacities, social capital, accountability and transparency. The focus is not just about the basics of collaborative process, but how to create transformational change through collaborative action. It is hoped that this review will provide some ideas about possible methods and next steps to collaboratively work on complex challenges across sectors.

There are already a range of collaborations that exist in the agriculture-land-food nexus. However, many need to be scaled up and made more effective. Greater focus is needed on possible pathways for scaling up collaborative action – to take forward the concept and applying it in practice. In addition, we need to address the fact that collaboration is made more difficult by sector-based institutions which lack the right enabling conditions. If we are serious about thinking and working at the nexus of agricultural and food systems, then our institutional arrangements have profound implications. At the very least, we should consider how to institutionalize collaboration through a change in organizational structures and cultures. Basic first steps would include:

- aligning staff and organizational incentives in different agencies to enable (collaborative) scaled action on a specific issue
- building nexus approaches and capabilities within our institutions, including the mental models to frame specialized work in the context of a larger complex system
- creating 'nudges' to incentivize collaboration in the workplace, including changing administrative structures to make collaboration the default option

These are only some of a wide range of possible solutions. Now is the time to take a step back to consider what these solutions would look like if we were to intentionally develop the institutional architecture to support collaborative efforts. This is an opportunity for champions of the nexus approach to move the system. Together we can identify priorities for change, different ways of conceptualizing challenges and the means to develop new collaborative efforts within and across organizations.

While collaboration has been portrayed here as an opportunity to do something differently, to work in a 'business as UNusual' way, the good news is that humans have, in fact, evolved in a way that relies on reciprocity and trust. Even Charles Darwin wrote that the survival and success of a social group is dependent on the extent of harmonious co-operation between members of that group (he devoted almost two chapters of *The Descent of Man* (1871) to showing how sociability, fidelity and co-operation might have developed as the result of natural selection). Rather than seeing collaboration as something new, perhaps we can think of it as a return to the old. The seeds of the future have already been planted. We just need to make them grow.

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APPENDIX I. RECOMMENDATIONS TO INCREASE THE SUSTAINABILITY OF AGRICULTURE

Publication	Organization	Principles/Recommendations
Achieving food security in the face of climate change: Summary for policy makers from the Commission on Sustainable Agriculture and Climate Change www.ccafs.cgiar.org/commission	Commission on Sustainable Agriculture and Climate Change (CSACC), Climate Change, Agriculture and Food Security research program of the CGIAR	1. Integrate food security and sustainable agriculture into global and national policies; 2. Significantly raise the level of global investment in sustainable agriculture and food systems in the next decade; 3. Sustainably intensify agricultural production while reducing greenhouse gas emissions and other negative environmental impacts of agriculture; 4. Target populations and sectors that are most vulnerable to climate change and food insecurity; 5. Reshape food access and consumption patterns to ensure basic nutritional needs are met and to foster healthy and sustainable eating habits worldwide; 6. Reduce loss and waste in food systems, particularly from infrastructure, farming practices, processing, distribution and household habits; and 7. Create comprehensive, shared, integrated information systems that encompass human and ecological dimensions.
Agriculture for Development: World Development Report 2008. http://go.worldbank.org/ZJIAOSUFU0	World Bank	Effective instruments for using agriculture for development: 1. Reforming trade, price, and subsidy policies (e.g. agricultural protection, agricultural taxation , trade liberalization, transitional support); 2. Bringing agriculture to the market (e.g. commodity trading , product standards, risk management, modern supply chains); 3. Supporting smallholder competitiveness through institutional innovations (e.g. land rights, reallocating resources, financial services for smallholders, insurance to manage risk, efficient input markets, producer organizations); 4. Innovating through science and technology (e.g. complementing genetic improvement, investing in R&D, extension and information and communication technology innovations); 5. Making agricultural systems more environmentally sustainable (e.g. agricultural water management, managing intensive livestock systems, reversing degradation, payment for environmental services); and 6. Moving beyond the farm (e.g. rural employment, schooling, training, and transition to the labor market, providing safety nets to reduce vulnerability).

Publication	Organization	Principles/Recommendations
A Green Growth Strategy for Food and Agriculture: Preliminary Report http://www.oecd.org/dataoecd/38/10/48224529.pdf	Organisation for Economic Co-operation and Development	A comprehensive and coherent strategy is needed: 1. To increase productivity in a sustainable manner - increasing resource use efficiency throughout the supply chain; 2. To ensure that well-functioning markets provide the right signals -- prices that reflect the scarcity value of natural resources as well as the positive and negative environmental impacts of the food and agriculture system; and 3. To establish and enforce well defined property rights -- property rights to help ensure optimal resource use, in particular for marine resources, land and forests, greenhouse gas emissions, air and water.
An Ecosystems Approach http://www.cbd.int/decision/cop/?id=7148	UN Convention on Biological Diversity (COP 5 Decision V/6)	Principles of the ecosystem approach: 1. The objectives of management of land, water and living resources are a matter of societal choice. 2. Management should be decentralized to the lowest appropriate level. 3. Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems. 4. Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem-management program should: a. Reduce those market distortions that adversely affect biological diversity; b. Align incentives to promote biodiversity conservation and sustainable use; and c. Internalize costs and benefits in the given ecosystem to the extent feasible. 5. Conservation of ecosystem structure and functioning in order to maintain ecosystem services should be a priority target of the ecosystem approach. 6. Ecosystems must be managed within the limits of their functioning. 7. The ecosystem approach should be undertaken at the appropriate spatial and temporal scales. 8. Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term. 9. Management must recognize that change is inevitable. 10. The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.

Publication	Organization	Principles/Recommendations
An Ecosystems Approach <i>continued from previous page</i>	UN Convention on Biological Diversity (COP 5 Decision V/6)	11. The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices. 12. The ecosystem approach should involve all relevant sectors of society and scientific disciplines.
An Ecosystem Services Approach to Water and Food Security www.unep.org or www.iwmi.org/ecosystems	UN Environment Program	The changes required in how we approach ecosystems, water resources management and food security: 1. Value ecosystem services from agroecosystems and non-agricultural ecosystems. 2. Manage agriculture as a continuum of agroecosystems that not only produce food, but also deliver a whole range of other ecosystem services. 3. Collaborate between sectors as multiple services from agroecosystems require support from different authorities and experts. 4. Manage all sources of rainwater and runoff for multifunctional agroecosystems at river basin level. 5. Use adaptive Integrated Water Resources Management supported by capable and empowered institutions to provide water for non-agricultural ecosystems. Specific opportunities to enhance food security and increase water productivity include: 1. The strategic placement of multipurpose trees in agricultural landscapes to tighten water, nutrient and carbon cycles. 2. In dryland agroecosystems with locally adapted cultivars, the holistic utilization of water and nutrients, provisions for herds and integrated tree-crop-livestock management. 3. In wetland ecosystems, the development of synergies with fisheries, aquaculture, livestock grazing, and horticulture and the strategic enhancement of tree cover without compromising the water regulating functions. 4. In crop systems, the targeting of surface water and groundwater management to bridge dry spells, careful nutrient management, innovative field practices and adapted cultivars. 5. In aquaculture and fisheries, the provision of healthy aquatic ecosystems with clean and oxygenated water for physical support and respiration, seed and feed. 6. In livestock systems, the development of animal management strategies to improve animal health and survival, feeding strategies such as the use of crop residues and other waste products, tree fodder, proper selection of fodder crops and implementing grazing management practices.

Publication	Organization	Principles/Recommendations
“Climate-Smart” Agriculture: Policies, Practices and Financing for Food Security, Adaptation and Mitigation http://www.fao.org/docrep/013/i1881e/i1881e00.htm	UN Food and Agriculture Organization (FAO)	1. Agriculture in developing countries must undergo a significant transformation in order to meet the related challenges of food security and climate change. 2. Effective climate-smart practices already exist and could be implemented in developing country agricultural systems. 3. Adopting an ecosystem approach, working at landscape scale and ensuring intersectoral coordination and cooperation is crucial for effective climate change responses. 4. Considerable investment is required in filling data and knowledge gaps and in research and development of technologies, methodologies, as well as the conservation and production of suitable varieties and breeds. 5. Institutional and financial support will be required to enable smallholders to make the transition to climate-smart agriculture. 6. Strengthened institutional capacity will be needed to improve the dissemination of climate-smart information and to coordinate over large areas and numbers of farmers. 7. Greater consistency between agriculture, food security and climate change policy-making must be achieved at national, regional and international levels. 8. Available financing, current and projected, are substantially insufficient to meet climate change and food security challenges faced by the agriculture sector. Synergistically combining financing from public and private sources, as well as those earmarked for climate change and food security are innovative options to meet the investment requirements of the agricultural sector. 9. To be effective in channeling fast-track financing to agriculture, financing mechanisms will need to take sector-specific considerations into account.
How to Feed the World in 2050 http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf	FAO	Prerequisites for global food security: 1. Enhancing investment in sustainable agricultural production capacity and rural development. 2. Promoting technology change and productivity growth. 3. Promoting trade, markets and support to farmers.

Publication	Organization	Principles/Recommendations
International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) http://www.agassessment.org/	IAASTD	1. Improve productivity and sustainability of crop systems 2. Improve productivity and sustainability of livestock systems 3. Develop breeding options for improved environmental and social sustainability 4. Improve forestry and agroforestry systems as providers of multifunctionality 5. Manage fishery and aquaculture systems sustainably 6. Improve natural resource management and habitat preservation 7. Use agricultural knowledge, science and technology (AKST) to improve health and nutrition 8. Adapt to climate change and mitigate greenhouse gas emissions
Millennium Ecosystem Assessment http://www.maweb.org/en/Reports.aspx#	Millennium Ecosystem Assessment	Key Steps Available to Reduce the Degradation of Ecosystem Services: 1. Change the economic background to decision-making: • Make sure the value of all ecosystem services, not just those bought and sold in the market, are taken into account when making decisions. • Remove subsidies to agriculture, fisheries, and energy that cause harm to people and the environment. • Introduce payments to landowners in return for managing their lands in ways that protect ecosystem services, such as water quality and carbon storage that are of value to society. • Establish market mechanisms to reduce nutrient releases and carbon emissions in the most cost-effective way. 2. Improve policy, planning, and management: • Integrate decision-making between different departments and sectors, as well as international institutions, to ensure that policies are focused on the protection of ecosystems. • Include sound management of ecosystem services in all regional planning decisions and in the poverty reduction strategies being prepared by many developing countries. • Empower marginalized groups to influence decisions affecting ecosystem services and recognize in law local communities' ownership of natural resources. • Establish additional protected areas, particularly in marine systems, and provide greater financial and management support to those that already exist. • Use all relevant forms of knowledge and information about ecosystems in decision-making, including the knowledge of local and indigenous groups.

Publication	Organization	Principles/Recommendations
Millennium Ecosystem Assessment <i>continued from previous page</i>	Millennium Ecosystem Assessment	3. Influence individual behavior: • Provide public education on why and how to reduce consumption of threatened ecosystem services. • Establish reliable certification systems to give people the choice to buy sustainably harvested products. • Give people access to information about ecosystems and decisions affecting their services. 4. Develop and use environment-friendly technology: • Invest in agricultural science and technology aimed at increasing food production with minimal harmful trade-offs • Restore degraded ecosystems. • Promote technologies to increase energy efficiency and reduce greenhouse gas emissions.
Realizing a New Vision for Agriculture: A roadmap for stakeholders http://www.weforum.org/reports/realizing-new-vision-agriculture-roadmap-stakeholders	World Economic Forum	The Three Goals of the New Vision 1. Meet nutritional demands while providing affordable choices across the food value chain: Increase agricultural production by 20% each decade and drastically reduce waste, towards the end of eliminating hunger and undernourishment; 2. Conserve or enhance the quality and quantity of natural resources and meet the challenges of a changing climate: Sustainably reduce the impact of agriculture on the environment; reduce the resource intensity of the footprint by 20% each decade; and 3. Drive rural and national economic development around the globe with well-targeted investments: Decrease the portion of rural inhabitants living on less than \$1.25/ day by 20% each decade.
Rural Poverty Report 2011 http://www.ifad.org/rpr2011/	International Fund for Agricultural Development (IFAD)	A focus on these two areas – smallholder agriculture and the rural non-farm economy – requires particular attention to, and increasing investment in, four issues: 1. <i>Improving the overall environment of rural areas</i> to make them places where people can find greater opportunities and face fewer risks, and where rural youth can build a future. 2. <i>Reducing the level of risk that poor rural people face</i> and helping them to improve their risk management capacity needs to become a central, cross-cutting element within a pro-poor rural development agenda. 3. <i>Advancing individual capabilities.</i> The productivity, dynamism and innovation in the rural economy depend on there being a skilled, educated population. 4. <i>Strengthening the collective capabilities of rural people</i> can give them the confidence, security and power to overcome poverty. Membership-based organizations have a key role to play in helping rural people reduce risk, learn new techniques and skills, manage individual and collective assets, and market their produce.

Publication	Organization	Principles/Recommendations
The Environmental Food Crisis: The Environment's Role in Averting Future Food Crises http://www.grida.no/publications/rr/food-crisis/	United Nations Environment Program	Seven options for improving food security in the short-, mid- and long-term: 1. To decrease the risk of highly volatile prices, price regulation on commodities and larger cereal stocks should be established to buffer the tight markets of food commodities and the subsequent risks of speculation in markets; 2. Encourage the removal of subsidies and blending ratios of first generation biofuels, which would promote a shift to higher generation biofuels based on waste (if this does not compete with animal feed), thereby avoiding the capture of cropland by biofuels; 3. Reduce the use of cereals and food fish in animal feed and develop alternatives to animal and fish feed; 4. Support farmers in developing diversified and resilient eco-agriculture systems that provide critical ecosystem services, as well as adequate food to meet local and consumer needs; 5. Increased trade and improved market access can be achieved by improving infrastructure and reducing trade barriers; 6. Limit global warming, including the promotion of climate-friendly agricultural production systems and land-use policies at a scale to help mitigate climate change; and 7. Raise awareness of the pressures of increasing population growth and consumption patterns on sustainable ecosystem functioning.
Agriculture: Investing in Natural Capital (Towards a green economy: pathways to sustainable development and poverty eradication) http://www.unep.org/greeneconomy/GreenEconomyReport/tabid/29846/Default.aspx	United Nations Environment Program	Investment priorities for greening agriculture: 1. R&D and agribusinesses 2. Plant and animal health management 3. Scaling up adoption of green agriculture by partnering with leading agribusinesses 4. Strengthening the supply chains for green products and farm inputs 5. Farm mechanization and post-harvest storage 6. Improving soil and water management and diversifying crops and livestock Enabling conditions: 1. Global policies • Elimination of export subsidies and liberalizing trade in agricultural products • Redress market power asymmetry • Food safety standards • Intellectual property

Publication	Organization	Principles/Recommendations
Agriculture: Investing in Natural Capital (Towards a green economy: pathways to sustainable development and poverty eradication) <i>continued from previous page</i>	United Nations Environment Program	2. National policies • Support for improved land tenure rights of smallholder farmers • Targeting programs for women smallholder farmers • Public procurement of sustainably produced food 3. Economic instruments • Capacity building and awareness-raising • Supply chains, extension services and NGOs • Integrating information and communications technologies with knowledge extension • Better food choices
Trade and Environment Review, 2009/2010 http://www.unctad.org/Templates/Page.asp?intItemID=3723&lang=1	UN Conference on Trade and Development (UNCTAD)	Three areas of sustainable, “green” growth that are of particular and strategic importance for the low-income and least developed countries: 1. Enhancing energy efficiency, often implemented in combination with material and resource efficiency. 2. Mainstreaming sustainable agriculture, including organic agriculture. 3. Harnessing the use of off-grid renewable energy technologies for sustainable rural development.
The Wageningen Statement: Climate-Smart Agriculture – Science for Action www.gscsa2011.org	The Global Science Conference on Climate-Smart Agriculture (GSCSA) October 26, 2011	1. Increase farm and landscape level research, education, extension and innovation in climate-smart agriculture: • Sustainable intensification – producing more with more efficient use of inputs and less of an environmental impact • Integrated scientific approach • Breeding for a 2030 world • Climate change mitigation • National decision policies and support to overcome barriers to climate-smart agriculture • Climate risk management • Communicating Science 2. All stakeholders to contribute to platforms and capacity enhancement that improve dialogue and learning about proven policies, technologies and practices for climate-smart agriculture. Implementing agencies from national governments, civil society, and the private sector provide the impetus for, and support to, proven climate-smart technologies and practices. 3. All stakeholders to put in place the needed policies, strategies and frameworks to build climate-smart agriculture, and the associated research and development. 4. National governments, regional organizations and private sector to allocate adequate financing to climate-smart agriculture, rural development and the associated research and development.

Publication	Organization	Principles/Recommendations
Food and Nutrition Security: Comprehensive Framework For Action Summary of the Updated Comprehensive Framework for Action http://un-foodsecurity.org/node/842	High Level Task Force on Global Food Security	<i>Twin-tracks</i> to food and nutrition security: 1. Meet the immediate food and nutritional needs of those at risk; 2. Build longer-term resilience by eliminating the root causes of hunger and poverty. A <i>Comprehensive Approach</i> requires: 1. Addressing all dimensions of food and nutrition security – availability, access, utilization and stability – and taking into account the interconnectedness and interactions between them; 2. Addressing the full spectrum of food and nutrition security, including sustainable agricultural production, procurement and distribution of food, and safety-net strengthening; 3. Integrating cross-cutting issues such as protection and promotion of human rights, gender equity, support to nutrition, management of sustainable ecosystems, and climate change mitigation and adaptation into law, policy and program design; and 4. Ensuring multi-sectoral engagement and coordination on agriculture, social security, trade and market, employment, health, education, nutrition, and humanitarian assistance. In practice, adopting a comprehensive approach calls for maximum synergy and coordination among all components of food and nutrition security and the sectors which influence them.

APPENDIX 2. TEMPLATE FOR DOCUMENTING COLLABORATIVE EFFORTS

1. Triggers – the situational context

1.1 Why was it decided that a collaborative approach was needed?

1.2 What were the drivers of the collaboration? Examples could include:

- System complexity
- High levels of interdependence/network connectedness
- Need for risk sharing
- Resource conditions/scarcity
- Previous history of efforts to collaborate
- Situation in which each partner has resources that other partners need (complementarity)
- Prior failure to address issues
- Political dynamics/power relations
- Policy/legal frameworks
- Levels of conflict/trust

2. Establishment and Approach

2.1 How was the collaborative effort established?

2.2 Did a series of formal and informal interactions take place?

2.3 How were agreement, commitment and implementation negotiated?

Structure and Governance	Resources and Capacities
☐ Conflict resolution ☐ Governance of behavior and relationships ☐ Structures for reaching agreement on collaborative activities and goals (intra-organizational level and inter-organizational levels) ☐ Administration (through appropriate coordination) ☐ Leadership (e.g. convener, advocate, technical assistant, facilitator, funder, champion, sponsors) ☐ Incentives	☐ Funding ☐ Time ☐ Technical and logistical support ☐ Administrative and organizational assistance ☐ Skills for analysis or implementation ☐ Capacity to build relationships(e.g. boundary spanners) ☐ Knowledge and competencies sharing ☐ Pragmatic trust-building processes
Social Capital	Accountability and Transparency
☐ Mutual benefit ☐ Mutual trust ☐ Reciprocity ☐ Mutual understanding ☐ Internal legitimacy ☐ Shared knowledge ☐ Shared theory of action/ change	☐ Of inputs and outputs ☐ Of processes ☐ Results-based accountability ☐ Partner accountability ☐ Performance consequences

3. Goals

3.1 What were the goals of the collaboration?

3.2 What was the scale of ambition?

4. Participatory facilitation processes

4.1 Were participatory processes used to facilitate group efforts?

5. Dimensions of collaborative process

5.1 Which of the dimensions in the table below were present?

5.2 Which were absent?

5.3 How did this influence the process?

6. Outcomes

6.1 What outcomes has the collaboration delivered? Possible direct and indirect impacts could include:

- Achievement of goals
- New institutions and/or changing inter-organizational culture
- Innovative strategies
- New modes of discourse
- Creating shared meaning
- Redistribution of power
- Self-governing partnerships, coordination, joint learning and joint action
- The creation of capacity to leverage resources and create results on the ground
- The creation of social, intellectual, and political capital
- High-quality agreements (and perhaps even implementation of agreements!)
- Increasing interaction and less conflict among partners
- Transactions among organizations become transformed into socially embedded relationships, new norms and social heuristics for addressing public problems
- Changes in the pre-existing or projected conditions of the system

7. Lessons learned

7.1 What lessons were learned?

7.2 What mistakes were made that others could learn from? Examples could relate to: governance, institutional fit, trust, conflict and social capital.

7.3 What worked?