Climate Change   **Sustainability**   **Conservation**

Joining the dots

Learning to work collaboratively to address climate change

Contents

Acknowledgements

1. Climate change – a systemic challenge

Climate change introduces new complexities and uncertainties into decision-making and planning. It also compounds pressing challenges posed by demographic, socio-economic and other environmental change taking place, such as meeting the rapidly growing demand for food, water and energy and addressing biodiversity loss.

However, current interventions that are designed to respond to development and environment challenges are fragmented across many sectors and institutions both public and private. The interventions themselves tend to be narrowly defined and assessed. And they're dominated by short-term priorities with very little focus placed on integrated approaches that would create space for learning and flexibility in decision-making and implementation processes. This makes it difficult, if not impossible, to tackle large-scale systemic challenges such as poverty, biodiversity loss and climate change effectively (UNEP 2010, Daw et al. 2011, Jones et al. 2011).

As such, there's a critical need to develop processes that enable decision-makers at all levels (community, national and global) and actors (public, private and third sector) to plan and act together and within complex interconnected systems if we're to develop a sustainable, climate-resilient future that supports social and ecological prosperity.

It is increasingly recognised that it's important to bring different knowledge sets, perspectives and interests together to better understand and balance trade-offs when designing and implementing robust strategies to address development and environment challenges (Vignola et al. 2009, Tschakert and Dietrich 2010, High Level Panel on Global Sustainability 2012). Responding to increased complexity and uncertainty requires civil society organisations and public and private sector actors to develop and use processes that support multi-stakeholder participation, learning, and systemic, adaptive management approaches (IPCC 2012, IDS 2012).

The demand for and interest in strategic ways to address and adapt to climate change provide a significant opportunity to research and develop processes that support such integrated and participatory decision-making (UK Stationery Office 2010).

This short paper is based on work undertaken by SEI and WWF-UK in 2010-2011 with stakeholders in three climate-vulnerable developing countries – Belize, Nepal and Tanzania. The work aimed to explore the opportunities for and barriers to taking integrated approaches to decision-making in the context of climate change. We reflect on and share our learning which may have wider application and impact beyond the three countries studied. Individual, more detailed country reports for each of the three countries are available on request.

BUILDING BRIDGES

In Tanzania the River Basin Water Boards and Catchment Committees help bridge national policies and strategies and local realities. However in most sectors there remains a large disconnect between national decision-making and district-level operations.
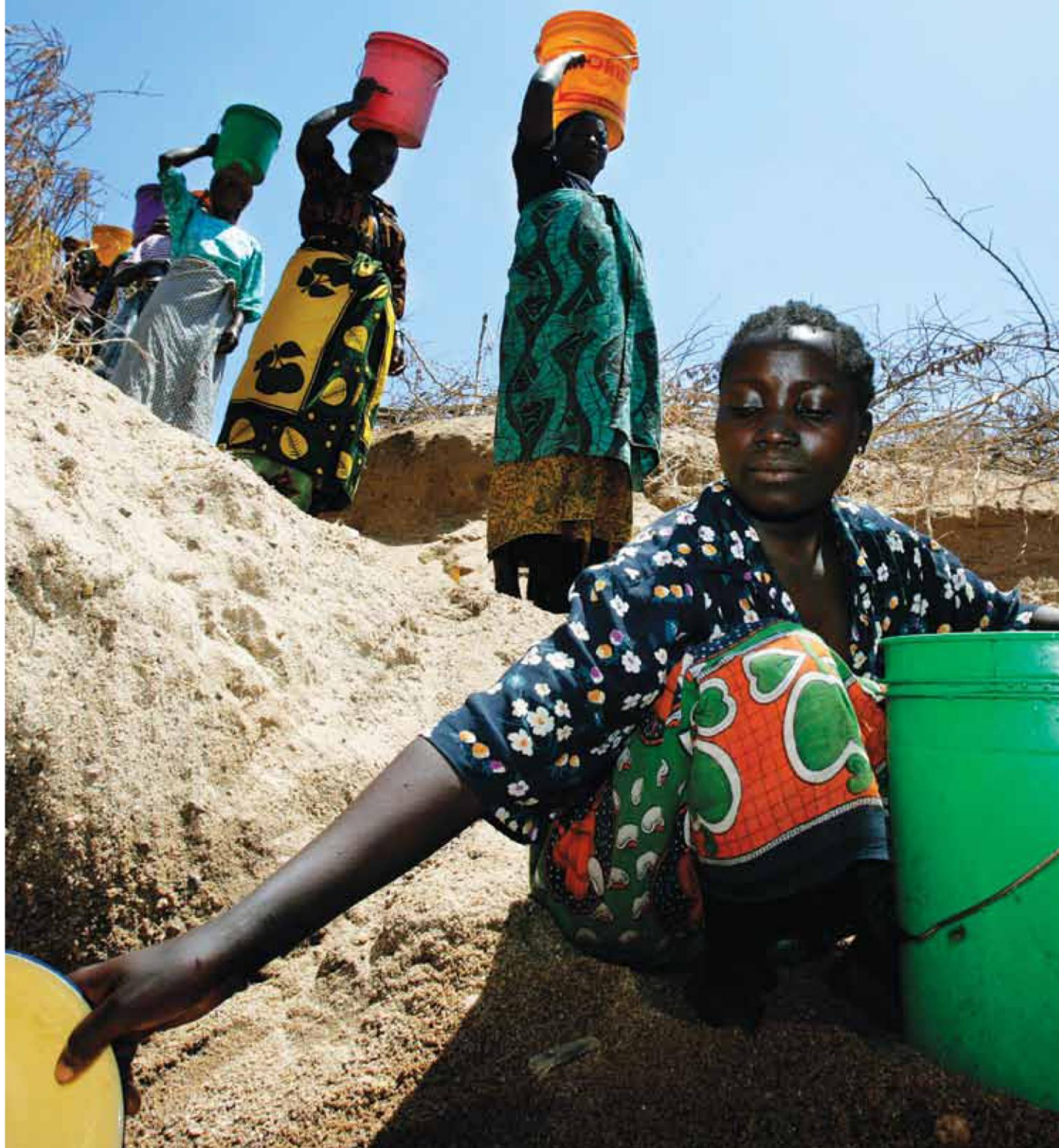
2. Taking a learning approach

Learning is recognised as an important process to facilitate decision-making. It addresses complex social and environmental dilemmas (Ballard 2005, Blackmore 2007) and is being understood as a key component of adaptive capacity (Tschakert and Dietrich 2010). The High Level Panel on Global Sustainability (2012) recognises "sustainable development as a dynamic process of adaptation, learning and action".

New policy processes to develop and implement climate adaptation strategies offer an important opportunity to embed learning and the learning process into decision-making and planning. Such learning processes can promote and support systems thinking. This is the process of understanding how things are connected, and how they influence each other within a larger whole as well as the emergent properties of that whole. Learning processes can also facilitate collaboration between stakeholders, bringing together different perspectives to understand collectively and address complex, interlinked dilemmas (Waring 1996, Blackmore 2007).

As such, our approach was designed to be exploratory, iterative and participatory. Alongside reviewing literature and interviewing individuals, SEI and WWF-UK attempted to connect people from various sectors (e.g. social development, disaster risk management, water, nature conservation and forestry) and at various governance levels (focusing mainly on the national level but linking with local and regional levels) around key research, policy and management questions. Our motivation for doing so was to bring different perspectives to bear on understanding the complex problems of climate change, development and environment that are unfolding in the three countries. And to explore how these can be effectively understood and tackled through governance systems.

Box 1. What is collective learning?

We use the term 'collective learning' to refer to learning that takes place through facilitated interaction between different actors. We are informed by work undertaken within the Social Learning for Integrated Water Managing (SLIM) project, which describes three ways of understanding social learning based on a comprehensive review of several learning theories (see Blackmore 2007). In this study we use collective learning to mean processes of interaction and the co-creation of knowledge that provide insights into the causes of a given situation and the means required to transform the situation as an integral part of concerted action (SLIM website, accessed January 2012). Our short study focused on the first part of this process i.e. interaction and co-creation of knowledge to provide insight into the causes of, and the means required to transform, the situation. We were not able within this study to work with participants towards concerted action.

We selected three countries that are highly vulnerable to environmental changes, where WWF is currently working – Belize, Nepal and Tanzania. We engaged stakeholders from different disciplines and sectors in these countries to explore the barriers and opportunities for taking a more integrated approach to governing complex systems under climate change. To frame wider governance issues and to help participants engage with 'systems thinking', we focused geographically on one or two key ecosystems in each country – coastal and marine ecosystems in Belize, freshwater ecosystems in Tanzania (specifically in the Great Ruaha catchment), and both mountainous and connected lower-lying ecosystems in Nepal (including the Terai-Duar plains).

Our research process combined desk-based research with participatory collective learning processes through three phases of activity (see diagram 1):

1. reviewing available literature on ecosystems, livelihoods and climate change, as well as relevant policy documentation;

2. a series of semi-structured interviews and a multi-stakeholder workshop in each country (over a period of 10-14 days, and involving 25-30 people in each country – on average half government officers and half NGO representatives and researchers);

3. analysis and iterative joint reflection between SEI and WWF to synthesise the key messages in written outputs.

Diagram 1:
The distinct phases of activity carried out as part of this study
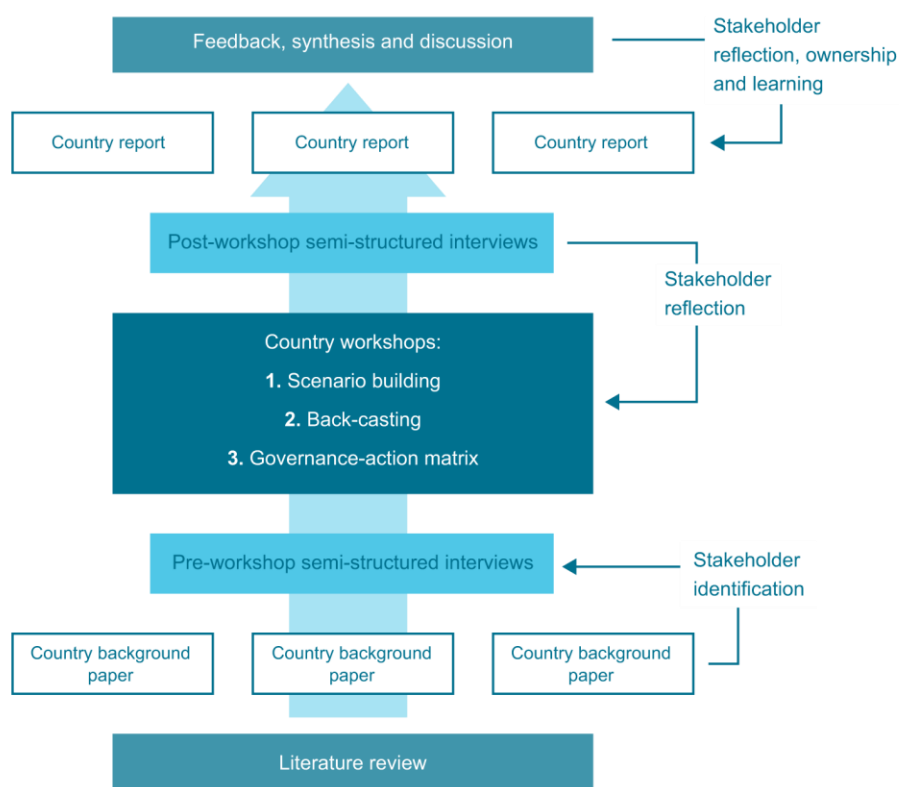
Stakeholders from government, academia and civil society organisations in Belize, Nepal and Tanzania participated in the workshops. This opportunity to learn collectively (i.e. interact, share and generate knowledge in groups) enabled stakeholders to:

• characterise the key drivers of change perceived to be at play in their respective countries in relation to the specific ecosystems under focus;

• map out the key components of the governance systems and the respective roles of the different actors in each;

• explore the complexity of interconnected human-ecological-climate challenges and how different governance approaches could address these; and

• identify barriers to, and opportunities for, taking integrated approaches within the current governance arrangements.

Our desk-based research generated information on the current understanding of the governance system in each of the three countries and of current and future climate impacts. The workshops encouraged participants to exchange ideas, build shared understandings and take a forward-looking perspective by picturing the impacts of multiple drivers of change on the country/region and asking how the governance system needed to change to address these interconnected challenges.

Reflecting on current practices and understandings through these workshops enabled a rich picture to be developed of the interactions between drivers of change and how a governance system may develop to support integrated decision-making that seeks to balance development and environment priorities, short- and long-term perspectives, as well as measurable and non-measurable factors and values.

Box 2. What do we mean by governance?

We use the term 'governance' to mean authorities, processes and procedures guiding strategic and key operational decisions (Lemos and Agrawal 2006, Stroker 1998). In the context of this study we focused on decisions pertaining to the use of natural resources and the management of ecosystems to support socio-economic development under a changing climate and a growing and increasingly mobile population. The 'governance system' includes the work of and interactions between public sector, private sector and civil society actors.

The main drivers of change identified by participants were:

- In Belize: migration of people from elsewhere in Central America to Belize, from inland parts of Belize to the coast, and from rural to urban areas; increasing levels of consumption on top of unequal access to resources; and rapid coastal development, including the widespread clearing of land and mangrove ecosystems for hotels and housing, the dredging of marinas, unplanned waste water discharges, and the construction of sea walls.

- In Nepal: human population growth and migration, especially into urban areas; widespread practices of unsustainable timber harvesting; uncontrolled grazing practices; the spread of invasive species; increased forest fires; political instability; and increasing disasters, especially as a result of landslides, floods and droughts.

- In Tanzania: human population growth and migration, including pastoralists moving into agricultural areas; over-grazing; expansive land clearance for agriculture; increasing conflict over water resources, notably between those involved in irrigated agriculture and hydro-power production; and high rainfall variability affecting crop yields.

Participants developed a picture of how the governance system in their country may develop by discussing and describing progressive levels of change needed to transition from a fragmented system of making and implementing decisions (level 1 – see Table 1) to a highly integrated governance approach better suited to dealing with the systemic challenges of climate change, development and environmental sustainability (level 4 – see Table 1). The participants' descriptions of these levels are summarised in Table 1 below. The descriptions suggest specific changes that would be needed in the structure and functioning of institutions and socio-institutional networks to move towards more integrated approaches to tackling interconnected problems. Participants also considered changes needed in elements of the governance system that had been identified as important through the interviews and workshop discussions. These included policies, strategies and plans; laws, regulations and incentives; and capacity and resources.
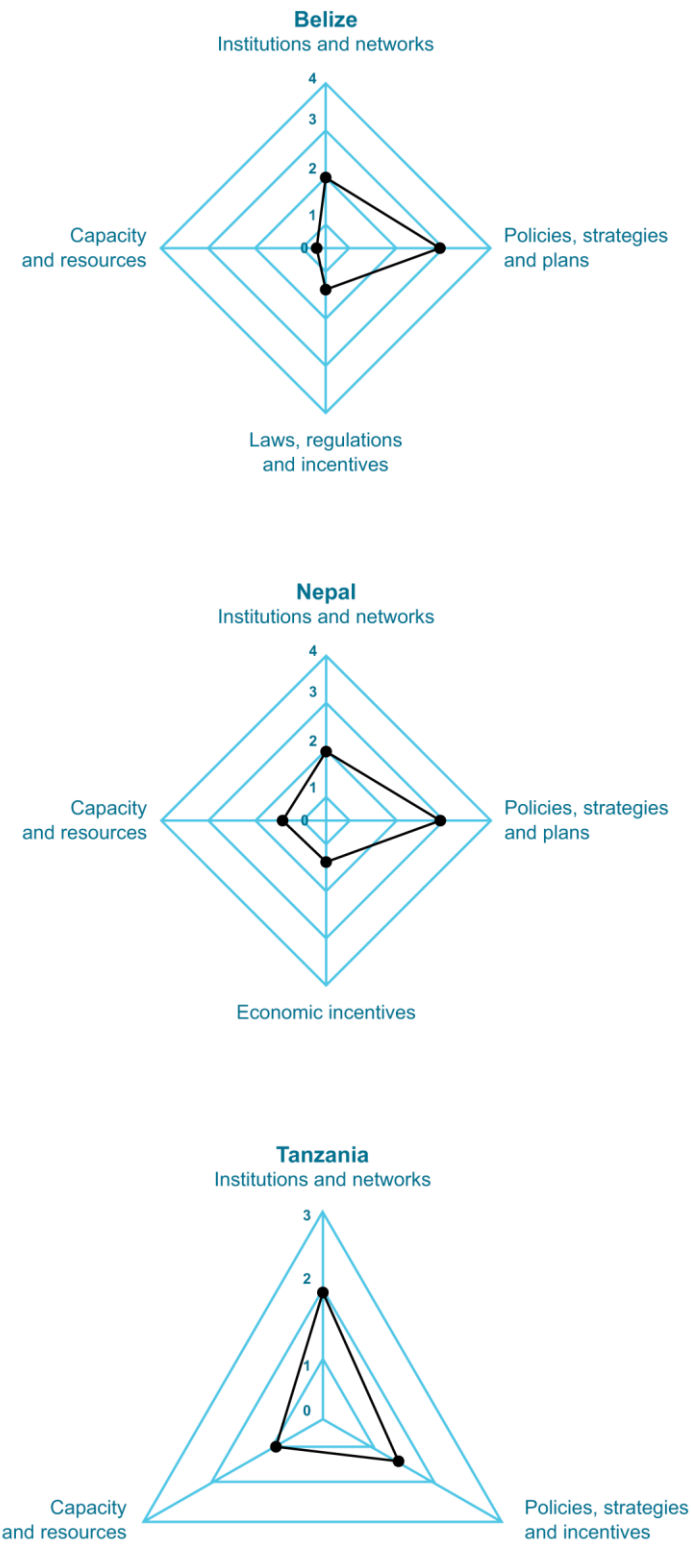
Table 1:
Summary of suggested changes needed in the structure and functioning of institutions and networks to move towards highly integrated approaches. A subset of the results from all three countries

	Level 1 – ad hoc, little or no integration	Level 2 – early integration between environment and development	Level 3 – building capacity to factor in climate change and new uncertainties	Level 4 – highly integrated responses put into operation
Belize	Government agencies lead early coordination efforts; early signs of networks forming between development and environmentally oriented organisations	Umbrella organisation with mandate to coordinate government agencies and interface with non-state actors; formalised collaborative relationships; agents of change emerge to encourage increased collaboration across public, private and civil society sectors; climate change committee formulates new policy and gets buy-in	National coordination platform linking to international agreements and other relevant networks working on issues of environment, development and climate change; all relevant government agencies engaged in sustainability and climate risk management	National climate change coordinating entity has buy-in at highest political level, power to convene and secure additional resources in the event of major climate events; transformational change occurring through extensive networks operating across many aspects of society; Belize plays an important role in setting regional precedents and standards; regional and international linkages extended and strengthened to leverage technology and knowledge transfers and funding, and influence international decision-making
Nepal	Government agencies have low level of understanding of climate change and no insitutional set-up to explicitly deal with it; no institutional set-up to explicitly deal with climate change; increased ratification of international conventions related to environment and climate change	Government agencies identify climate change issues; coordination among sector and line ministries is at the initial stage; network support in identifying issues and formulating climate change documents at national and local level; increased participation in international negotiations	Government agencies implement National Adaptation Programme of Action (NAPA) and Local Adaptation Plans of Action (LAPA); monitoring mechanisms are in place; networks form to prioritise least developed countries' (LDCs) issues in international forums, lobbying to secure funds	Government agencies pursue strong coordination efforts and work closely with civil societies; effective functioning of government agencies equipped with human and financial resources; strong international commitments to mitigate climate change
Tanzania	Limited coordination between various government ministries; few people in-house with expertise and experience in dealing with climate change issues; not many multi-stakeholder forums functioning effectively	Integrated Water Resources Management (IWRM) planning that integrates climate-related issues; local government authorities undertaking land-use planning; extension services to provide suitable climate information at the local level	[Note: participants in Tanzania were only able to attend a one-day workshop, so to deal with time constraints the exercise was condensed to explore three levels of integration and three elements of the governance system instead of four]	The Division of Environment in the vice president's office is knowledgeable about climate issues and working closely with sectoral ministries, district councils, river basin offices and non-state actors to implement the National Adaptation Strategy and Action Plan in alignment with the IWRM plan in the Great Ruaha

These levels were presented visually as radar plots. Several participants suggested that the plots could be developed as a useful way to document baselines of the level of integrated governance linked to the issues being discussed for their country. The plots would need to be further developed based on inputs from additional stakeholders to be representative of the national status quo.

Diagram 2:

Radar plots visually presenting the overall results from the participatory assessment of the current governance system in each country. The levels on each axis are those described in Table 1

Belize
Institutions and networks
Capacity and resources
Policies, strategies and plans
Laws, regulations and incentives

Nepal
Institutions and networks
Capacity and resources
Policies, strategies and plans
Economic incentives

Tanzania
Institutions and networks
Capacity and resources
Policies, strategies and incentives

This workshop exercise was useful (and holds promise) as a method for collectively gathering and debating perceptions, building consensus, and displaying aggregate results. Because the results are contingent on the facilitation of the exercise and the mix stakeholders involved, caution should be applied when comparing between the plots from each country. Due to workshop constraints the exercise had to be condensed to three elements and three levels in the Tanzanian case. It is interesting, although not surprising, to note that in all three countries participants perceive the policies, strategies and plans that are in place to be well ahead of developing the institutional capacities and resources needed to put them into operation.

3. Factors that hinder integration

A number of barriers were identified that hinder integration within the prevailing governance systems of Belize, Tanzania and Nepal.

Fragmented mandates, disconnected policies, political volatility and segregated planning and management practices, as well as technical practices, have significant negative implications for taking integrated approaches to dealing with interconnected human-ecological-climate challenges. Problems are often dealt with in isolation, based on short-term perspectives, without sufficient consideration for how responses affect all social groups and the coupled social-ecological system. The main barriers identified through the interviews and workshops are shown in diagram 3 and described further below.

Diagram 3:

Barriers to integration within the governance systems of Belize, Tanzania and Nepal. The arrows indicate where there are clear mutual dependencies between the barriers
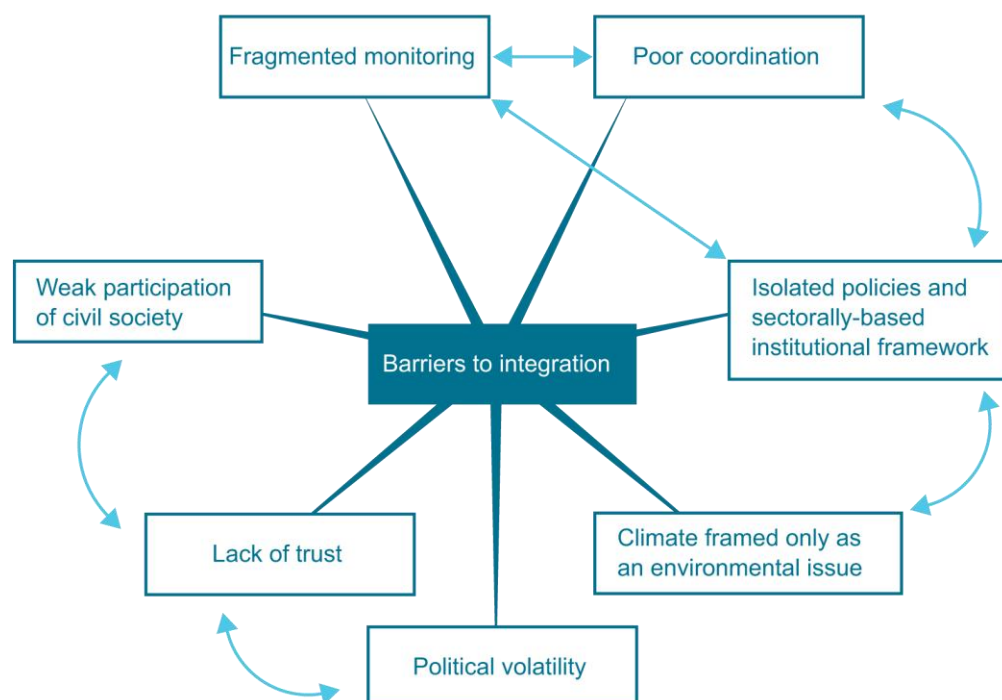
3.1 Disjointed policies and weak mechanisms for coordination

Efforts at integration are still largely being undertaken within a sector-based institutional framework – i.e. a highly disaggregated and fragmented institutional set-up that has weak mechanisms for effective coordination and limited incentives for collaboration across sectors and between different levels of decision-making. For example, in Belize participants mentioned that there are many different sectoral policies and plans in place but only very few inter-sectoral strategies, such as the Coastal Zone Management Strategy, that make it possible to balance between different, often contradictory, priorities. In addition, there is very limited budgetary support and frequently conflicting mandates for the implementation of cross-sectoral actions.

Box 3. Fragmented governance systems: an example from Tanzania's Great Ruaha river catchment

Decision-making about how to address climate variability and change in the context of managing water resources and aquatic ecosystems in the Great Ruaha river catchment is currently distributed between multiple actors. These include: local farmers; fishermen; livestock herders; National Park managers; the Rufiji Basin Water Office; TANESCO (the national power company); numerous sectoral ministries (e.g. Water and Irrigation, Agriculture, Natural Resources and Tourism, Forestry, etc.); national inter-sectoral policy bodies (e.g. National Wetlands Steering Committee); the National Environmental Management Council; the Division of Environment in the vice president's office; various international agencies (e.g. United Nations Environment Programme, World Bank); among many others. There are currently very few effective mechanisms in operation for the coordination of decisions, activities and learning between these multiple actors. The fragmentation of mandates and lack of coordination manifests as increasing conflict over water allocation and access between sectors (especially between irrigated agriculture and energy production), extensive soil erosion and watershed degradation associated with livestock grazing and land clearance for crop cultivation, dramatically reduced environmental flows due to damming and extraction, altered flooding patterns affecting the health of wetland ecosystems, etc.

3.2 A narrow framing of climate change

In all three countries climate change is still first and foremost framed as an environmental issue, making it difficult to get many individuals and organisations with development or commercial mandates to take up the issue of climate change in the context of their work. In Belize, the government mandate to address climate change is split between the National Meteorological Services and the Ministry of Natural Resources. Similarly in Nepal, the government mandate to address climate change has resided primarily with the Ministry of Environment. These institutions have limited capacity and influence to facilitate the establishment of strong integrated national strategies to deal with climate change as a cross-sectoral issue. In the case of Tanzania, efforts to mainstream environmental issues, including climate change, into broader policy-making processes have led to the policy and coordination mandate being elevated to the vice president's office, to be undertaken by the Division of Environment working through environment units that are being established in each of the sectoral ministries.

In addition, there is often limited management at a landscape or ecosystem level (e.g. coastal zone, water catchment) taking into consideration interlinked ecological functions and services. This shortcoming means that climate-ecosystem links are not always clearly understood and communicated to a wider set of actors involved in the decision-making for land-use planning within relevant directorates and ministries. Recent studies in Belize, for example, have started

to analyse and measure how coastal and marine ecosystems interact and factor in the links between them and social actors who live in coastal areas. These studies also assess some of the services provided by these ecosystems for climate adaptation (WRI 2009). Preliminary results have been considered in the development of the *Horizon 2030 Vision* for Belize, which is going to guide the long-term development of the country.

3.3 Limited commitment and participation

In an early effort to deal with climate change as a cross-cutting issue, Belize, Nepal and Tanzania have all established multi-stakeholder committees or councils on climate change at the national level. These include representatives from across a range of sectors, but tend only to include national level actors, and predominantly public sector officials. Although civil society stakeholders, as well as private sector representatives, could play a key role in the functioning of these committees, mechanisms for their participation are not well defined. Moreover, while the committees in Belize and Tanzania have been in existence for a number of years they have been dormant for long periods and it is proving difficult to get clear agreement on their terms of reference so that they can be fully operational and effective.

Box 4. National committees for climate change

In Nepal, the government has established a National Climate Change Council, chaired by the prime minister, as a cross-sectoral coordination body active in drafting the National Climate Change Policy, directing Nepal's position in international negotiations, and working to leverage international finance and technical support for climate change initiatives. In both Belize and Tanzania, a similar mandate has been assigned to a National Climate Change Committee, chaired by the country's designated UNFCCC focal point. In Belize, the chair of the committee is based in the National Meteorological Service, while in Tanzania the chair is based in the Division of Environment in the vice president's office

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3.4 Fragmented assessments and monitoring

Various NGOs and research organisations working in these three countries are monitoring ecosystems and conducting assessments of the vulnerability of key sectors and livelihood groups to changing climatic conditions, extreme weather events and ecosystem degradation. To a large extent, however, these assessments tend to happen in isolation in terms of methodology, spatial and temporal focus, and disciplinary expertise involved – and the results and supporting data are not made widely accessible. There are some notable exceptions, for example a participatory monitoring system is being built up in Belize to assess the health of coral reef ecosystems based on collaboration between researchers, NGOs, local fishermen and dive operators. These types of monitoring networks could be used as the basis for developing new approaches and testing alternative practices for facilitating development that are sensitive to the functioning of ecosystems and better suited to changing climate conditions. Bringing different databases and assessment results together could provide a better understanding of how interconnected systems as a whole are co-evolving to inform more integrated decision-making. Processes, tools and institutional arrangements that promote early sharing of information and learning would enable the more effective management and flow of knowledge among stakeholders involved in various ways in development and environmental management practices.

3.5 Political volatility and a lack of trust

Coordinating decisions and actions between the national and local levels remains a huge challenge, expressed by participants in all three countries. In Nepal, years of political volatility have undermined the functioning of local government units, limiting local planning efforts to implement policies and measures to deliver services, manage forests and water resources, reduce the risk of disasters, etc. In Tanzania, there remains a large disconnect between national decision-making and district-level operations. In the water sector, the formation of intermediary levels, such as the River Basin Water Boards and Catchment Committees, helps in bridging between national policies and strategies and local realities. In Belize, partly because of its relatively small size in both area and population, there are much closer links and tighter integration between the national and sub-national government levels. In all three countries, NGOs are playing an important role in bridging between the national and local levels, but people mentioned a lack of trust between government actors, NGOs and private sector agents as a factor that undermines collaborative efforts. Many participants in our research process, when discussing the need and potential for improved collaboration, mentioned their lack of an overview of 'who is doing what' as a barrier to proactively forming partnerships, as well as a source of overlapping mandates, conflicts over funding, and limited trust between stakeholders.

4. Opportunities for furthering integration

By reviewing current policy documentation, interviewing representatives from key institutions and facilitating a structured dialogue between the participants, we found current practices in Belize, Tanzania and Nepal that represent opportunities for moving the process of integration between development, environmental sustainability and climate adaptation forward. The impetus to address climate change is often a driver for this progress (see table 2).

Opportunities identified for moving the process of integration forward include new forms of public-private partnerships (PPPs). These were emphasised particularly by study participants in Belize and Nepal. The establishment of new market-based mechanisms, like reducing emissions from deforestation and forest degradation (REDD), was also highlighted as a potential basis for diversifying the economic base of the country and leveraging newly-valued ecosystem services. In general, payment for ecosystem services (PES) as a concept and an emerging set of principles was raised by numerous interviewees and workshop participants as providing new opportunities for innovation and as constituting part of a shift to developing greener economies. Some concerns were raised, however, around the inequities and social injustices that may result from implementing such market-based mechanisms. Nevertheless, PES schemes are being explored in all three countries.

In the context of Belize, Tanzania and Nepal, participants mentioned that the main challenge for developing PES initiatives is to find ways of linking national and local interests. For example, in Belize there has been a successful local pilot project valuing the services provided by mangrove ecosystems for the farming of shrimp. However, there is currently no mechanism or institutional arrangement in place to formalise a PES agreement, and support at the national level is required in order to sustain such an initiative over the long term and scale it out to other areas or sectors.

Table 2:
Opportunities for moving forward the process of integration between development, environmental sustainability and climate adaptation, with specific examples from Tanzania, Belize and Nepal

Opportunity	Tanzania	Belize	Nepal
Climate change mainstreaming	National Strategy for Growth and Reduction of Poverty (MKUKUTA II) gives explicit importance to addressing climate change	Climate change is being mainstreamed into Horizon 2030, the long-term national development framework for Belize	The new national development plan (2010-2013) refers explicitly to climate change in terms of disaster risk reduction, environmental protection and the potential for revenue generation through mitigation
National climate change strategy	National Climate Change Committee has been set up; efforts are well under way to try and leverage international funding to implement NAPA projects; mandatory Environmental Impact Assessment (EIA) provides a point of entry for factoring climate considerations into local development decisions and practices	National Climate Change Committee is in place and clear terms are being agreed; Belize coordinates with other Caribbean countries for international climate negotiations and hosts the Caribbean Community Climate Change Centre; mandatory EIA is seen as one mechanism for factoring climate considerations into local development decisions and practices	A National Climate Change Policy is currently being drafted – it's set to tackle issues of resettlement and reducing deforestation; NAPA formally launched in late 2010 – it's being extended down to the local level to generate LAPAs in consultation with government entities, NGOs and civil society groups
Integrated land-use planning and natural resources management	New institutions are being set up at the river basin and sub-catchment levels to bridge between the local and national levels of government and coordinate with non-state actors; the Rufiji Basin Water Office is currently drafting an Integrated Water Resources Management and Development Plan to provide strategic guidance on actions to be taken across the whole basin over a five-year period	A Coastal Zone Management Strategy has been developed, out of which a Coastal Zone Management Plan is being drafted, taking an integrated perspective on development demands, resource use and environmental challenges experienced in the coastal zone of the country. The plan explicitly considers climate change among other threats	The Nepal Water Plan and Strategy has specified the piloting and implementation of Integrated Water Resources Management, which is likely to emerge as the main approach to managing water resources in the country. Also, Nepal is the pioneer country in South Asia to adopt landscape level conservation, with two trans-boundary conservation landscapes that extend into neighbouring countries: the Terai Arc Landscape and the Sacred Himalayan Landscape

Box 5. Payment for ecosystem services

Payment for ecosystem services (PES) refers to a suite of approaches building on a central idea: 'the transfer of resources among social actors with the objective of creating incentives to align individual and/or collective land-use decisions with the social interest in the management of natural resources' (Muradian et al. 2010). Although the concept of PES offers a series of theoretical advantages compared to conventional conservation approaches, the concept has generated controversy over commoditising environmental services to promote cost-effective and equitable conservation without considering complex and context-specific idiosyncrasies (Pascual and Corbera 2011, Corbera et al. 2007). Current evidence on PES is inconclusive in terms of its cost-effectiveness and the conditions under which it has positive environmental and socio-economic impacts, particularly in developing countries with weak governance (Pattanayak et al. 2010). However, the potential benefits and challenges posed by PES schemes promote innovative thinking and critical debate. New formulations of PES try to reconcile its current mercantile rationale with forms that are better adapted to particular cultures and specific 'value contexts', and to redefine it through an environmental justice lens (Gomez-Baggethun 2011).

Other opportunities to foster integration exist where current structures and processes of multi-stakeholder participation can be used to further foster learning and build shared understandings as a basis for effective collaboration across sectors and levels of decision-making – for example, the reef monitoring programme in Belize and the LAPA consultations in Nepal. The role of 'boundary organisations' that interface between government, academia, businesses and civil society was recognised by study participants as key in building bridges between different networks and decision-makers – e.g. the role that WWF-UK and SEI were jointly playing in undertaking this study. Although processes of dialogue and exchange do not ensure the adoption of more integrated approaches, they offer a critical basis for building trust between various institutional actors and stakeholder groups and for promoting shared understandings and goals as a basis for collaboration and supporting inter-sectoral and cross-scale actions.

The use of systematic monitoring and integrated assessment approaches is central to building the knowledge bases required to deal with new complexities and uncertainties that climate change introduces into development and environmental conservation and management practices. Building, maintaining and using such monitoring and assessment systems requires extensive and ongoing collaborations, as articulated by those in Belize involved in the reef monitoring network.

COLLABORATIVE INVESTMENT 🐼

It's vital that policies and programmes are designed and implemented in ways that meet complex and interlinked challenges effectively. To achieve this, stakeholders must invest time and energy in collaborative efforts to learn together, and co-generate knowledge and decisions over priorities and outcomes.

5. Key lessons and reflections

5.1 Participant feedback

Participant feedback suggested that the workshop process of jointly exploring drivers of social and ecological change in their country and associated opportunities for innovation in how to address and deal with these changes was empowering. The workshops provided space for participants to share insights on the interconnections between human, ecological and climate systems and better understand different institutionalised viewpoints on the associated problems and potential solutions. This provided a basis for exploring potential new collaborations, for example in Tanzania the Rufiji Basin Water Office, the small-scale farmers union (MVIWATA), the District Agricultural Officers, the Meteorological Agency and the University of Dar es Salaam working together to improve the production and use of both seasonal and decadal climate information. Similarly, participants in Belize discussed opportunities to expand and thereby strengthen networks working on disaster risk management by including actors that have specialist climate knowledge, such as the National Meteorological Service.

Numerous workshop participants were surprised to find that grappling with the complexities of interlinked problems together with others working in quite different fields and organisations ultimately helped them attain greater clarity, rather than generating additional confusion. Many participants expressed their appreciation for having an opportunity to a step back from their day to day activities to work with other people in exploring the system as a whole, the changes emerging, their role in the system and opportunities for tackling pressing environment and development problems differently. This suggests that collective learning and system thinking did occur and was found to be beneficial.

5.2 Broader lessons and reflections

A number of broader, more generic lessons and reflections have emerged during and from the study, which are particularly relevant for those planning and implementing climate change adaptation strategies, as well as those seeking to ensure better integration of policy and practice across sectors, levels and agencies in a changing world.

In terms of strengthening governance and supporting effective decision-making to address the challenges of climate change, development and environment, key lessons include:

- The impetus to design policies and practices for addressing climate change at the national and local levels provides an important opportunity to develop systems thinking within and between different sectors and stakeholder groups as a basis for tackling systemic challenges and taking a longer-term perspective.

- Investment is needed in building stronger networks and collaborations that can connect different fields of expertise and multiple levels of governance to address the complexity of the interlinked development, environment and climate change challenges.

- NGOs and civil society organisations are playing a number of important roles in supporting more integrated approaches to decision-making. They're bridging national and local levels

of government and supporting the flow of knowledge between them – for example, by presenting proposals to national climate change committees on ways of factoring local knowledge and practices into current policy options.

- Investment is needed to develop the facilitation, mediation and communication skills necessary to foster collective learning. Such skills are critical in the process of making decisions that involve difficult trade-offs where the needs of different communities and sectors under both present and future climate conditions have to be considered.

- For longer-term planning, collaborative cross-sector and multi-disciplinary approaches that bring together different perspectives, knowledge and skills can support a better understanding of trade-offs over time and place. This can support low/no regret decision-making that maintains future options, which is increasingly important given climate scenarios and uncertainty. The process of doing this also helps build the adaptive capacity of individuals and institutions engaged.

In Belize, Nepal and Tanzania specifically, but of relevance to other countries:

- In institutional terms climate change is still mainly framed as an environmental issue that's separate from and peripheral to mainstream social and economic development. But this is starting to shift towards recognising the need to factor climate change concerns into development decisions. Early efforts are being made in all three countries to integrate climate change considerations into development visions and strategies (see table 2 for specific examples), although these need to go further to ensure they are not superficial.

- There are currently weak mechanisms for effective coordination, and limited incentives for meaningful collaboration between different sectors and levels of decision-making. But multi-stakeholder committees or councils on climate change have recently been established at the national level in an effort to facilitate more and better coordination.

- There is a limited scientific knowledge base of localised climate risks and vulnerabilities for organisations to draw on when attempting to factor climate change into sectoral and especially cross-sectoral decisions.

In terms of facilitating a participatory process of collective learning to support more integrated approaches (in this case to climate change, development and environment), some of the key lessons we've taken from this work are that:

- Bringing multiple stakeholders with different rationales and experiences together can be challenging for all involved and may require working through or with various conflicts and contestations. But it often gives rise to new insights that are highly valued by the participants and lays an important foundation for future collaboration and collective action.

- Achieving positive outcomes that are shared by workshop conveners and participants requires skilled and reflexive facilitation through a well-designed, iterative process.

- It is difficult to adequately capture and convey the richness of a participatory process to people who were not involved, but this is often called for and so needs careful planning and documentation.

- The realities of competition over access to funding, data, specialist knowledge, influential people and the setting of agendas need to be carefully addressed when eliciting participation and negotiating expectations.

- Collective learning-by-doing requires a lot of trust and patience shared between all those involved (i.e. all facilitators and participants). This has to be earned and maintained, and may require more time than is often allotted in traditional project planning.

Box 6. Investing in collaboration

Investing time and energy in collaborative efforts to share and co-generate knowledge, learn together, develop new ideas and deliberate over priorities and outcomes is critical to designing and implementing policies and programmes that have a chance of being effective in meeting complex and interlinked challenges.

5.3 New questions and areas for future research

This study has raised a number of questions about how complex problems such as climate change are framed, and how this framing affects the interventions or strategies that are prioritised and who is involved in (and excluded from) deciding on and implementing these. A related question that has surfaced during this work is how to effectively facilitate and sustain the sharing of data, information, and flows of knowledge between different departments, organisations and sectors on various aspects of complex challenges that are core to the mandate of some but peripheral to that of others. In applying the concept of governance during this study, we recognised a need to further explore and unpack the benefits and drawbacks of a predominantly competitive, results-oriented governance approach as compared with a more collaborative, process-oriented governance approach – specifically in terms of restoring and maintaining ecosystem functioning, reducing social inequality, and addressing climate vulnerability.

Another area for further research is developing tools to support robust and integrated decision-making that explicitly deal with the uncertainties and complexities stemming from the multiple interactions and feedbacks between social, ecological and climate systems across various spatial and temporal scales. In this regard it could be fruitful to involve multiple stakeholders in co-constructing and legitimating a conceptual and/or computational model of the system used to reveal assumptions, test options and support strategic decision-making, especially when dealing with complex, ill-defined environmental and development policy problems (Vennix 1999, van den Belt 2004, Etienne 2010). SEI hopes to be able to explore some of these questions in future work.

This study has highlighted a critical facilitation function that can be played by WWF and other civil society organisations. As bridging organisations they can bring together actors from across sectors and levels for collective learning to address complex, interconnected social-ecological and climate-related dilemmas. Developing this role may support the transformational change needed to tackle the large-scale systemic challenges of poverty, biodiversity loss and climate change.

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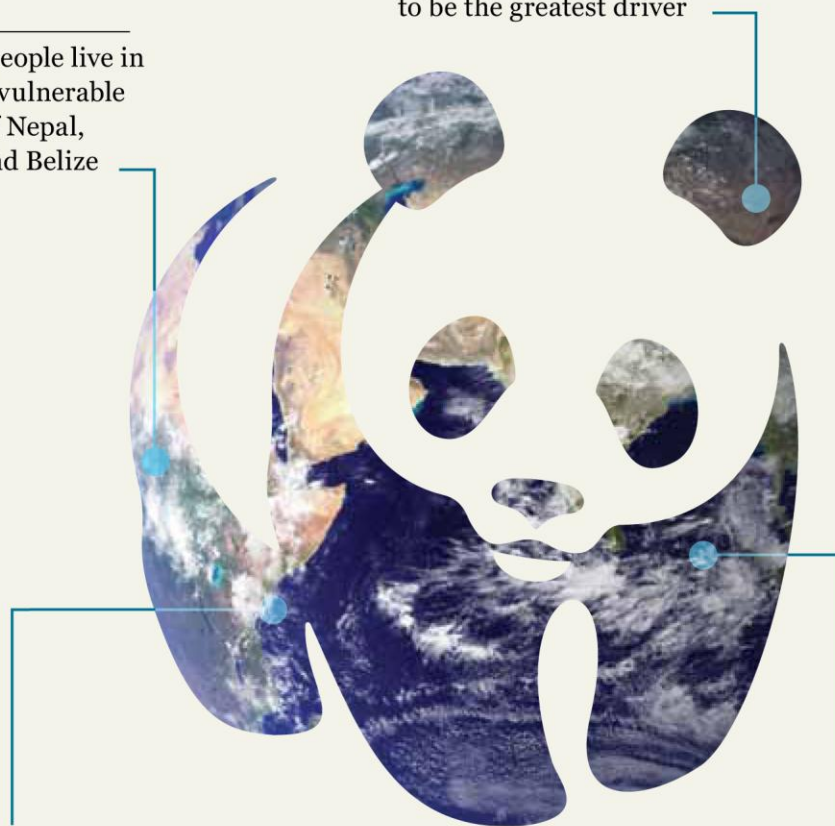
Climate change adaptation in numbers

25%

Proportion of species that are roughly estimated to become extinct by 2050, with climate change likely to be the greatest driver

77M

77 million people live in the climate vulnerable countries of Nepal, Tanzania and Belize

47

Number of least developed countries who have developed National Adaptation Programmes of Action (NAPAs)

US$231–437M

Estimated value of coastal protection per year provided by Belize's coral reefs and mangroves

WWF

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To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.
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