Multilevel Stakeholder Influence Mapping in Climate Change Adaptation Regimes

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CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

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Abstract

The extent to which any policy, planning, or funding frameworks aimed at supporting climate change adaptation contribute to improved adaptive capacity of smallholder farmers is strongly affected by the power/influence dynamics between actors within those regimes. Power and influence studies have renewed relevance due to the current proliferation of adaptation initiatives. As these initiatives evolve, they bring up questions of equity, justice, and fairness surrounding the origins and distribution of adaptation resources. In doing so, they have shed light on persistent inequalities in status quo development regimes and asymmetrical power balances between stakeholders.

To avoid exacerbating inequalities that contribute to conflict, perpetuate cycles of poverty, and prevent much needed resources from reaching vulnerable communities, it is essential that practitioners seek to make power/influence relationships transparent within any given adaptation regime. Exposing and characterizing these relationships is complex, sensitive, and involves multiple perspectives. This paper introduces the Multilevel Stakeholder Influence Mapping (MSIM) tool, which aims to assist analysts in the study of power dynamics across levels within climate adaptation regimes.

The tool is adapted from the Stakeholder Influence-Mapping tool (2005) of the International Institute for Environment and Development (IIED). MSIM is a simple visual tool to examine and display the relative power/influence that different individuals and groups have over a focal issue—in this case, climate change adaptation of smallholder farmers. The tool can be applied individually or in groups, as often as desired, to capture multiple perspectives and also to act as an intermediary object facilitating expression of sensitive information. The multilevel adapted version of the tool was trialed with a cross-section of actors in Nepal's agricultural climate change adaptation regime. The results of this pilot, the tool use guidelines, and triangulation with supporting methods, as well as forward-looking applications in climate adaptation are provided herein.

Keywords

Power; Influence; Climate change; Adaptation; Agriculture; Policy; Governance; Nepal.

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Acronyms

CA	Constituent Assembly
CAS-N	College of Applied Sciences-Nepal
CBO	Community-based organizations
CCC	Climate Change Council
CGIAR	Formerly the Consultative Group on International Agricultural Research. CGIAR is now a global research partnership for a food secure future
CPI	Climate Policy Integration
CPN-M	Communist Party of Nepal (Maoist)
CPN-UML	Communist Party of Nepal (Unified Marxist-Leninist)
CSH	Critical Systems Heuristics
DADO	District Agricultural Development Office
DANIDA	Danish International Development Agency
DDC	District Development Committee
DfID	UK Department for International Development
DoLS	Department of Livestock Services
ESG	Earth Systems Governance
ESSP	Earth System Science Partnership
GCM	General Circulation Models
GEF	Global Environment Facility
GHG	Greenhouse gas
GIZ	German Agency for International Cooperation
GLOF	Glacial Lake Outburst Flood
GoN	Government of Nepal
ICIMOD	International Centre for Integrated Mountain Development
IIED	International Institute for Environment and Development
IMF	International Monetary Fund
INGO	International non-governmental organization
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
LAPA	Local Adaptation Plan of Action
LDC	Least Developed Countries
LEG	LDC's Expert Group
LGCDP	Local Governance and Community Development Program

MLD	Ministry of Local Development
MoAC	Ministry of Agriculture and Cooperatives
MoAD	Ministry of Agriculture Development
MoE	Ministry of Environment
MoFALD	Ministry of Federal Affairs and Local Development
MoIR	Ministry of Irrigation
MoSTE	Ministry of Sciences, Technology and Environment
MSIM	Multilevel Stakeholder Influence Mapping
NAPA	National Adaptation Programmes of Action
NARC	Nepal Agricultural Research Council
NC	Nepali Congress
NGO	Non-governmental organization
NORAD	Norwegian Agency for Development Cooperation
NPC	National Planning Commission
PM	Prime Minister
SIA	Systemic Integrated Adaptation project
SLD	Shared-Learning Dialogue
TWG	Thematic Working Groups
UCPN-M	Unified Communist Party of Nepal-Maoist
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
VDC	Village Development Committee

Introduction

Small-scale agricultural producers in developing nations are hardly new to challenges. They face persistent livelihood threats of both natural and socioeconomic varieties. Many of the 2.6 billion individuals that engage in agriculture worldwide (IAASTD 2009) cope with extreme climatic events and variability (e.g., drought, floods, pests/diseases), limited access to agricultural inputs and markets, fluctuating commodity prices, lack of basic health and sanitation services, and in many cases, persistent cultural and structural inequalities. Meanwhile, the global food system faces never-before-seen pressures as the world population grows to an estimated 9 billion people by the year 2050 (UN-DESA 2010). Efforts to meet the caloric demand of this rapidly growing population will encounter a number of major existing constraints and others looming on the horizon. For example, food demand and distribution trends that reinforce existing caloric inequalities continue today, compounded by asymmetrical trade barriers and subsidies (Burton and Lim 2005). Demand for cereals is expected to increase by 70% to 2050, as a result of growing populations and increasing per-capita incomes, particularly in Asia (FAO 2006). All the while, regions like South Asia and sub-Saharan Africa, where the majority of the world's hungry reside, contain extensive areas of low agricultural productivity due to a degrading resource and biodiversity bases (Vermeulen et al. 2012). Cutting across all of these challenges over the coming decades is the issue of climate change.

Modest estimates of global warming trends indicate a 2 degrees Celsius rise in global mean temperatures within the next century (Moss et al. 2008) with some recent estimates suggesting as much as 4.5 degrees Celsius. Even a 2 degrees Celsius rise in mean temperature will destabilize current farming systems (Easterling et al. 2007), transforming production patterns and crop productivity. The adverse effects of climate change on agricultural production are likely to be more intense in lower-latitude countries, particularly in the tropics and subtropics, even though the amount of temperature change here is projected to be less than in higher latitudes (Funk and Brown 2009; Lobell et al. 2008; Parry et al. 1999). It is in these regions, where achieving food security is already problematic and crops are grown closely to their limits of heat tolerance and moisture availability, where the impacts of climate change will be felt with more intensity.

Whether food systems in developing nations can keep pace with growing food demands in the face of progressive climate change is a question concerning producers, decision-makers, and researchers alike (Hazell and Wood 2008; Ziervogel and Ericksen 2010). While efforts to encourage mitigation of greenhouse gases (GHGs) have dominated international fora over the past decade, adaptation to the imminent impacts of climate change has achieved greater visibility in recent years (Kates 2000; Parry 2009; Pielke et al. 2007; Smit and Wandel 2006) owing to the presentation of adverse impacts on agricultural systems and an increase in the frequency of extreme events.

The role of state agencies and other national-level actors in actively promoting adaptation (planned adaptation) across governance levels—or fostering adaptation at the individual and community levels through the facilitation of an enabling environment—has been the subject of recent debate. Particularly so with the widespread establishment of national and international planned adaptation arrangements, such as the National Adaptation Programmes of Action (NAPA) of the United Nations Framework Convention on Climate Change (UNFCCC). While many academics and practitioners in adaptation theory suggest that success in adaptation will require simultaneous action, both planned and autonomous, on multiple levels (Adger et al. 2005; Cash et al. 2006; Ostrom 2012; Sovacool and Brown 2009), there remains a gap in our understanding of how central-level institutions influence coping and adaptation/adaptive capacity at lower levels (Adger 2001; Berman et al. 2012).

Ultimately, adaptation to climate change is a political process. It involves actors and institutions at multiple levels, biding for financial resources, constructing and maintaining institutions, prioritizing actions, and determining the allocation of scarce and competing resources. As such, the extent to which planned adaptation contributes to the improved adaptive capacity of small-scale producers will be determined, in part, by the relative power/influence of actors within the climate change adaptation regime.

Power and influence

An assessment of the institutional processes at play in any climate change adaptation regime is not complete without mention of the role of power. Power is a ubiquitous term and its various ontological and epistemological origins and manifestations difficult to identify. It is, as the concepts of adaptation, sustainability, and resilience, a boundary term, and its meaning highly dependent on the context in which it is applied.

Power in the social sciences is often defined as the potential of an agent to influence a target (French and Raven 1959). Michel Foucault contributed an element of ‘resistance’ (“Where there is power, there is resistance”) to power relations in his work *The Subject and Power*, which has been subsequently adopted by most political theorists (Foucault 1982). As such, in political science, power is commonly defined as “the ability to influence the behavior of others with or without resistance.” In practice, power is often used interchangeably with the concept of “influence” (i.e., power produces influence and influence produces power), and can be exercised in more nuanced settings beyond that of “power over” another agent, including “power to” (i.e., capability) and Foucault’s concept of power as the enforcement of social and political practices occurring between agents, created by institutions and the discourses around them.

Despite the vastness of the topic, power and influence studies have been viewed with renewed relevance as of late, due to the proliferation of climate change adaptation funds, projects, and programmes. As these processes evolve, they bring up questions of equity, justice, and fairness surrounding the origins and distribution of climate change adaptation resources. In doing so, they have shed light on persistent inequalities in status quo development regimes and asymmetrical power balances between stakeholders.

In particular, the uncertainties and imperfect information related to the impacts and timing of climate change inject increased urgency in the study of power dynamics. In recognition of this, considerable emphasis has been placed on improving the ways that research is accessed and used in decision making around climate change.

Douglas and Wildavsky (1982), for example, suggest that science and knowledge will never completely dictate policy since factors like values, power, and institutions will always intervene between knowledge and action. This pathway from knowledge to action can be especially tenuous when uncertainty prevails and information is particularly imperfect as is the case with climate change adaptation. Crozier and Friedberg (1977), in respect to their theory on organized action, refer to uncertainty as the "fundamental resource for any negotiation" and further suggest that "what appears as uncertainty from the point of view of the problem at stake constitutes power from the point of view of actors." This concept can be applied between actors as well, suggesting that uncertainty can be used to leverage power and command decision-making authority between stakeholders, a role that governments are particularly likely to take.

Dimitrov (2003) further discusses the topic of uncertainty as it relates to constructivist and rationalist decision-making theories, introducing a glaring paradox surrounding environmental policy regimes; i.e., *that they have developed at all* given extreme uncertainty and imperfect information (or sometimes a complete lack of information) to guide regime formation. Dimitrov suggests that "if collective action does not require information, than rational choice theories lose a major foundation." He further suggests that constructivists, who see politics as a product of social learning, are equally without justification for decision making, concluding that if "shared knowledge is not an important independent variable, why study it as a dependent variable?"

The study of power and equity within adaptation regimes extends beyond controlling or leveraging knowledge and information. "It relates to a wide range of issues including: decision-making processes—who decides, who responds; frameworks for taking and facilitating actions; relationships between the developed and developing world; and also to relationships between climate change impacts and other factors that affect and disturb" (Thomas and Twyman 2005). Improving our understanding of how power and influence originate and manifest in adaptation institutions can lead us to support fair and sound decisions in resource allocation and ensure that vulnerable populations are appropriately safeguarded from significant impacts of climate change.

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) has initiated research in this regard, trialing a tool for mapping stakeholder power and influence. This paper contains the results of piloting a multilevel adaptation of that existing methodology.

Influence mapping

IIED stakeholder influence mapping

Stakeholder influence mapping is a "simple visual tool to examine and display the relative influence that different individuals and groups have over decision making and how influence and cooperation change over time." It was developed by James Mayers and Sonja Vermeulen at the International Institute for Environment and Development (IIED) and trialed under CCAFS Theme 1, Adaptation to Progressive Climate Change. See an example in Figure 1.

The tool uses circles to represent different actor groups and individuals, placed within a pyramid where the policy/legislation (or broad scenario) in question serves as the pyramid cap or apex.

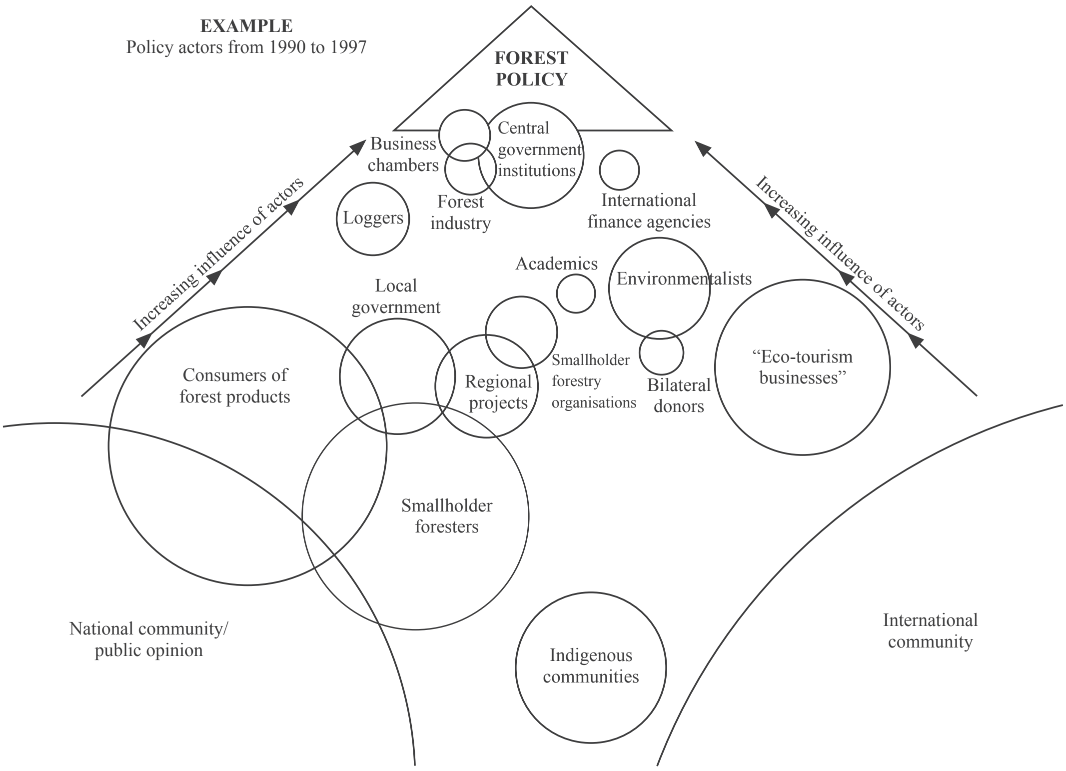


Figure 1. Example IIED influence-mapping exercise

SOURCE: Mayers and Vermeulen 2005.

Influence is shown in the relative closeness of the circles to the policy apex, while relationships (degree of cooperation/conflict, etc.) are indicated by relative proximity and overlap of the circles. Different colour and size circles can be used to represent stakeholder groups during the mapping activity (e.g., individuals, government, and civil society) and the analysis can be done for different time periods to track policy evolution over time. Note that in this example (Figure 1), the output map is displayed in black and white with only the actor labels serving to distinguish between actor group type. The exercise has been traditionally conducted in focus group format, with selected policy "movers and shakers."

The IIED tool has been utilized by CCAFS in trials in Uganda in 2010 as a means of delineating strategies for influencing climate change adaptation policy (CCAFS 2010). The rationale for conducting the exercise was that in addition to the transfer of technologies to risk-averse small-scale producers, an enabling policy environment that provides safety nets in support of adaptation is necessary. Entry points for lobbying policy change as well as explicit areas for policy improvement were identified in the mapping exercise. Specifically, the focus group revealed that the President has the strongest direct influence on the behavior of farmers and that a disconnect exists between researchers and implementing agencies on the ground. The study also yielded key insights towards the development of coalitions between key actors in the climate change regime in Uganda (CCAFS 2010).

While the outcomes from the Uganda trialing were fruitful, they reflect power and influence dynamics primarily at the central policy level. Focusing solely on "policy movers and shakers" at this level can produce a biased understanding of powerful agents and reinforce existing inequalities between actors. Climate change manifests across actor levels and scales and requires multilevel responses from a host of agents. Given the concentration of vulnerable populations in rural settings, power dynamics across levels and their role in creating adaptation pathways that reach from (inter) national to local settings are important. Adjusting the tool to capture these cross-level dynamics is thus a valuable step in improving our understanding of how power descends/transcends actor levels.

Multilevel stakeholder influence mapping

The adaptation of the Stakeholder Influence-Mapping tool to encompass power dynamics across actor levels reflects a systems approach to adaptation research. That is, when addressing complex, "wicked problems" (Rittel and Webber 1973) like that of climate change, we are consistently making boundary decisions as to the scope of the problem, impacts, and responses. How we choose to draw those boundaries around scope, scale and time frame of adaptation, which disturbances elicit the need to adapt, and what drives the notions of desirability or improvement of the system often completely determines the conclusions and recommendations for action (Helfgott 2011). Because we each have different perspectives, interests, values and so on, it is likely that we will make different boundary judgements in the same situation. Understanding, then, how decision-making boundaries are drawn and perceived by influential (or thought to be influential) actors provides insight into how success in adaptation is measured, who is intended to benefit, and where climate change policies are most susceptible to distortion or manipulation.

Critical Systems Heuristics (CSH) is a systemic methodology for handling several key perspective-related issues: (1) that system boundary judgements are inevitable and everyone makes them, scientists, planners, lay people alike; (2) that these boundary judgements are subjective and shaped by our values; (3) that they determine the knowledge generated and the conclusions and recommendations for action drawn; and (4) that planners can only ever refer back to the original whole of system judgements to justify the merits of propositions. It is a methodology that supports professional practice through critical employment of the systems idea and a framework for reflective practice. In Ulrich's words: "Critical Heuristics is an effort to provide planners and citizens alike with the heuristic support they need for confronting the problems of practical reason [socially rational practice]" (Ulrich 1983).

To operationalize these concepts, Ulrich developed a set of 12 'critical systems heuristics' questions that both planners and ordinary people could use to think through and debate issues. These questions are asked about both what the situation is and what it ought to be, focusing on four areas: (1) Motivation – why would you want to be planning/intervening in this system in the first place? (2) Control – who should have decision-making power? What should people have some say over, and what shouldn't they have a say over? (3) Knowledge and expertise – what forms of knowledge are necessary and from what sources? (4) Legitimacy – what are the values this is based on? Are you creating an oppressive system or one that benefits some and hinders others, and if so, what should you do about it?

These CSH principles capture key components of power and influence in any decision-making process and, consequently, serve as a strong addition to the IIED stakeholder influence-mapping tool.

Adapting the tool to elicit individual perceptions of influence at multiple levels requires only minor adjustments to the existing methodology, namely:

1. Translating the policy apex across levels (Step 1 in Box 1). We often use a different language to refer to the same concepts at different actor levels. While the apex title "climate change adaptation policy in agriculture," for example, may suffice for mapping by actors at the constitutional level, this concept means very little to small-scale agricultural producers

Box 1. The nine steps in the Stakeholder Influence-Mapping Process

1. **Define policy focus.** Influence mapping is applicable to almost any decision-making ('policy') scenario. The choice of policy focus depends on the aim of the discussion among the participants—the overall problem or questions about policy that they are confronting. The tool can be applied to all sorts of policy contexts, from specific local policies to very broad positions involving government agencies and others such as the private sector.
2. **Define one or more key time periods.** Most simply, stakeholder influences at one time (usually the present) can be mapped. To explore policy change, more than one time period can be chosen, based for example on past/present/future, or based around a key event (before/after).
3. **Identify policy stakeholders.** Some of the main individuals and groups that have an impact or interest in the policy's formation and implementation need to be identified and listed—either by participants in the mapping exercise, or perhaps with some pre-identification by the facilitators with the participants completing the process.
4. **Prepare materials.** One pyramid, drawn and labeled on a large sheet of paper, is needed for each time period. Other materials required are a selection of cardboard or paper circles in different sizes (different colours too if possible), some marker pens, and boards to pin up the pyramids so that all participants can see them. Alternatively the pyramid and circles can be laid out on the ground. The circles will be used to represent the various stakeholders over time, so that roughly the minimum number to prepare is the total number of stakeholders identified multiplied by the number of time periods. Having multiples of the same size and colour is useful.
5. **Fine-tune the stakeholder list.** If there is a long list of stakeholders, a relevant subset can be selected from the full list for each time period under discussion. Do not spend too long on this step, keep the full set of stakeholder groups if participants disagree on which to include.
6. **Estimate stakeholder group size.** Different sized stakeholder groups can be represented by different sized paper circles representing the number of people in the group (smallest=fewest, biggest=most). If there are a large number of stakeholder groups, different coloured circles could be used to represent different types of stakeholder groups (e.g., to differentiate government, private sector, and civil society groups).
7. **Map stakeholder influence and relationships.** This is the key step in the process—arranging the circles within the pyramid to display influence and relationships. Influence is shown by the relative closeness of circles to the policy apex, while relationships (degree of cooperation or conflict, and shared or divergent views) are indicated by the relative proximity and overlap of the circles. Most of the participants' time should be allocated to this step.
8. **Identify key moments and mechanisms**. Policy events, notable moves made, and key external changes that have helped or hindered the process can be noted as they occur during the mapping exercise. Make sure to allocate some time to capture this useful information—one tactic is to select a note-taker or rapporteur among the participants.
9. **Keep record of map for future reference.** Sketching or photographing the map provides a useful record, especially if the notes and comments made by participants are also recorded.

SOURCE: Mayers and Vermeulen 2005.

at the operational level. Consequently, the apex title must be translated in such a way that it remains comparative across levels yet relevant to each stakeholder group. "Climate change adaptation policy in agriculture" may translate to "food production" or "food production in uncertain weather conditions" at the farm level, for example. The appropriate apex titles can be derived from semi-structured interviews (conducted before applying the tool) with actors at various levels that elicit commonly used terminology in reference to a fixed concept.

2. Identify key moments and mechanisms (Step 8). The Multilevel Stakeholder Influence Mapping proposed here would serve as a visual activity within a one-hour semi-structured interview. That is, the completed influence map (conducted early in the interview) serves as the 'object' of an elicitation question, or a directive approach that uses a picture, video, text, or an object to prompt or elicit discussion (Tracy 2013). It has been suggested by some authors that the use of such an elicitation device can provide more realistic responses than would be collected through the use of words only (Prosser 2011).

Interviews are conducted with only one stakeholder at a time, to avoid domination in a group setting. This is particularly important in places with embedded power inequalities produced by caste structures or the like, which lead to micropolitics of domination in focus group settings. The tendency for the concentration of decision making in the hands of a dominant elite occurs across levels. As suggested by Heller (2001), even "when a weak state devolves power it is more often than not simply making accommodations with local strongmen rather than expanding democratic spaces." Even more, embedding the tool in an interview format allows the analyst to capture these key moments and mechanisms in a way that reflects the cross-level realities of policy analysis. That is, what stakeholders make of the policies and the interplay between different policies is contingent upon the standpoint taken; either 'top down' or 'bottom up' (Sabatier 1986; Urwin and Jordan 2008). As proposed in the existing methodology, a note-taker/rapporteur role will be played by the principal interviewer. While the influence mapping is occurring, the respondent will provide responses to a series of questions designed to elicit concepts of motivation, control, knowledge, and legitimacy—the key components of the CSH framework.

With these two adaptations in mind, multilevel stakeholder influence mapping includes the following steps articulated in Box 2.

Nepal case study

MSIM was piloted as part of the Systemic Integrated Adaptation (SIA) project, a CCAFS Theme 1 initiative. The broader SIA research employs three principal data collection methods: (1) multilevel stakeholder influence mapping; (2) semi-structured interviews with stakeholders across actor levels in the climate change adaptation regime; and (3) the content analysis of 16 adaptation and related policy documents. MSIM piloting, then, represents just one data collection method employed at the Nepal field site. A total of 14 separate respondents participated in the MSIM pilot, including six national-level respondents, six district-level respondents, and two local village-level respondents. Local-level (operational) components of this research were conducted in Nepal's Rupandehi District, Makrahar Village Development

Box 2. The eight steps in the MSIM process

1. **Define policy focus.** Influence mapping is applicable to almost any decision-making ('policy') scenario. In this case, climate change adaptation policies, projects, and programmes.
2. **Identify influence-mapping respondents.** For the segment of respondents representing collective action and operation levels (district and village, respectively in the case of Nepal), a sampling strategy will need to be applied, starting with the selection of an administrative district. This can be done on the basis of vulnerability to environment change, should that information be available in the study country.
3. **Identify relevant stakeholders to be mapped.** A list of public sector, private sector, NGOs, bi/multilateral donors, community-based organizations (CBOs), and so on should be established prior to the interview process. The list used in Nepal's MSIM pilot contained approximately 90 actors.
4. **Present the respondent with the list of actors in spreadsheet format.** Ask the respondent to place a checkmark ('tick') next to the actors that they feel are MOST RELEVANT to the success or failure of the agricultural sector in the study country in the face of climate change. The respondent is free to add new actors to the list, or suggest that other be removed if they feel strongly. Allowing the respondent to remove an actor can reveal perceptions of "figure heads" or other perceived low-influence actors. On average, 14 actors were selected by each respondent as highly relevant in the Nepal pilot, but there should be no limit placed on the number of actors the respondent can 'tick' as relevant.
5. **Introduce the power-mapping board** (Appendix 1). State that the exercise you are going to do together is designed to visualize power and influence between actors, as it relates to a certain policy or topic. Starting from our list of 'ticked actors,' we will be drawing circles on the mapping board with the most influential actors/actor groups closest to the top of the pyramid and the least influential at the bottom. Influence can be legal and non-legal, legitimate and illegitimate. The respondent should be told that the <u>objective is to define how things actually are, not the way that they are intended to be</u>. Relationships between actor groups can be represented by overlapping/concentric circles. Additional actors that come to mind that were not initially indicated in step 4 by the respondent can now be added. **Note:** An example, unrelated influence map can be shown to the respondent to be sure that they understand the concept.
6. **Define "influence" and its relation to "power"** as it is understood within your conceptual framework (note that this will be different for every study). An example could be: Power = the ability to influence the behaviour of others, with or without resistance (Positional, Personality, Persuasion, Coercion, Force, Knowledge, Resources. These are referred to as power bases); Influence = the ability to exercise a particular type(s) of power.
7. As each actor is placed on the map, ask:
   a. What type of power/influence is this actor/actor group exercising? (Positional, Party association, Personality [charisma], Persuasion, Coercion [bribery], Force, Knowledge, Resources?)
   b. What gives this actor/actor group the right to exercise power? **Note:** This is aimed at drawing out policy/legal frameworks.
   c. Do you see this actor/actor group as legitimate or respected?
8. Once the mapping is complete, **review the influence map with respondent.** Ask:
   a. Which are the main policies, laws, or constitutional mandates related to the environment, climate change, sustainable development (agriculture, livestock, and food security), or local governance in the study country that affect the relationships between these actors?
   b. Do policies from different sectors contradict or conflict one another? In what way? How about positive interplay (e.g., reinforcing one another in a beneficial way)?
   c. Ask the respondent to study the actors at the top of the newly created influence pyramid. Do you think that these top actors should be the ones making these decisions or have this much influence?
   d. Where do these actors go for knowledge and expertise? Where should they go? Where would you go?
   e. Who else should have a say? By what means/channels do they have a say?

Committee (VDC), located in south central Nepal along the Indian border. District-level (collective action) data collection occurred in the municipality of Bairahawa, Rupandehi's designated District Development Committee (DDC); while central-level (constitutional)[1] data collection occurred in Nepal's capital city, Kathmandu. Interviews lasted on average 1.5 hours. Data were collected between May and September 2012.

Results

The MSIM apex of "agricultural climate change adaptation policy" was translated across actor levels as identified in Box 3.

Box 3. Influence apexes as translated across actor levels

a. Climate change adaptation policies in agriculture (Central Level)
b. The design and implementation of climate change adaptation initiatives or strategies in agriculture (District Level)
c. The ability to produce food, earn income, or subsist when the weather changes (Local Level)

The chosen apexes reflect the stages of the policy development process, denoted by Sabatier and Jenkins-Smith (1993) as "stages heuristics:" (1) problem identification, (2) agenda setting, (3) formulation, (4) adoption, and (5) evaluation. The stages heuristics view of the policy process necessarily involves actors across levels, with the 'policy' and associated agents manifesting in different ways during each stage of the development, implementation, and evaluation process. The development of new crop varieties, for example, consists of a set or prioritized objectives and responsible parties at the central level (e.g., crop varieties, climate stressor, responsible agency, and so on), research and development and replication facilities at the regional and district level, and participatory varietal selection initiatives at the community level. Each stage mobilizes different agents performing diverse tasks under one policy umbrella.

Participants in the influence-mapping exercise were asked to first indicate actors (individuals or organizations) "relevant" to the policy apex, translated for the appropriate actor level. A comprehensive list of approximately 90 actors (see Appendix 2) was developed through snowballing interviews conducted prior to the influence-mapping trials, during the first phase of the field research. Respondents were encouraged to write-in any actors/actor groups they perceived to be 'missing' from the list. Table 1 shows the actors/actor groups most frequently identified as "relevant" to climate change adaptation regimes (in % of respondents) by the entire sample of 14 respondents.

1. The terms 'operational,' 'collective action,' and 'constitutional' refer to the levels of analysis in Ostrom's Institutional Analysis and Development Framework (Ostrom 1999).

Table 1. Actors/actor groups most frequently identified as "relevant" to agricultural climate change adaptation regimes in Nepal by percentage of respondents

Actor/Actor Group	Frequency (% of respondents)
Ministry of Agriculture Development (MoAD)	81%
District Development Committee (DDC)	75%
International Non-Governmental Organizations (INGOs) (World Vision, IDE, CARE, WWF, Practical Action, Oxfam, Action Aid, among others)	69%
National Planning Commission	63%
Farmers	63%
Village Development Committee (VDC)	63%
Political Parties (NC, CPN-UML, UCPN-Maoist, CPN-Maoist, Madhesi Front, and so on)	63%
Ministry of Irrigation	56%
Agricultural Cooperatives	56%
Indian Government	56%
Traders	56%
Ministry of Environment	56%

The respondent then visually ranked each of the actors deemed "relevant" on an influence pyramid with the most influential positioned at the top, or apex of the pyramid, and the least influential at the bottom. The size of the circle, as suggested in the methodology, represents the relative size of the actor group and overlap of actor circles suggests a relationship (embedded hierarchical structure, collaboration between agencies, and so on). Four distinct colours represent actor/actor group categories including civil society (purple), state agencies (red), international/foreign agency (blue), and private sector (orange). Select influence maps created by individual actors from the local to national policy-making level can be found in Figure 2. Note that these MSIM maps in Figure 2 are intended only to provide an idea of the trends produced through multiple applications of the MSIM tool. Respondent names and the individual actor labels for each circle have been removed.

A detailed example of an MSIM map as completed by a district-level actor can be found in Figure 3. The respondent[2] is a bureaucrat working in a relevant district office in Bairahawa —one of two principal municipalities in Rupandehi district—located only 10 km north from the Indian border. The respondent identified a total of 26 'relevant' actors to the design and implementation of climate change adaptation initiatives or strategies in agriculture from the complete list of 90. These 26 respondents were ranked on 19 unique influence levels during the ranking portion of the exercise. The World Bank, Asian Development Bank (ADB), and the International Monetary Fund (IMF), for example, represent three distinct actor groups, but have been ranked on the same level of influence.

2. The respondent's identity and office have been excluded from this document to ensure anonymity.

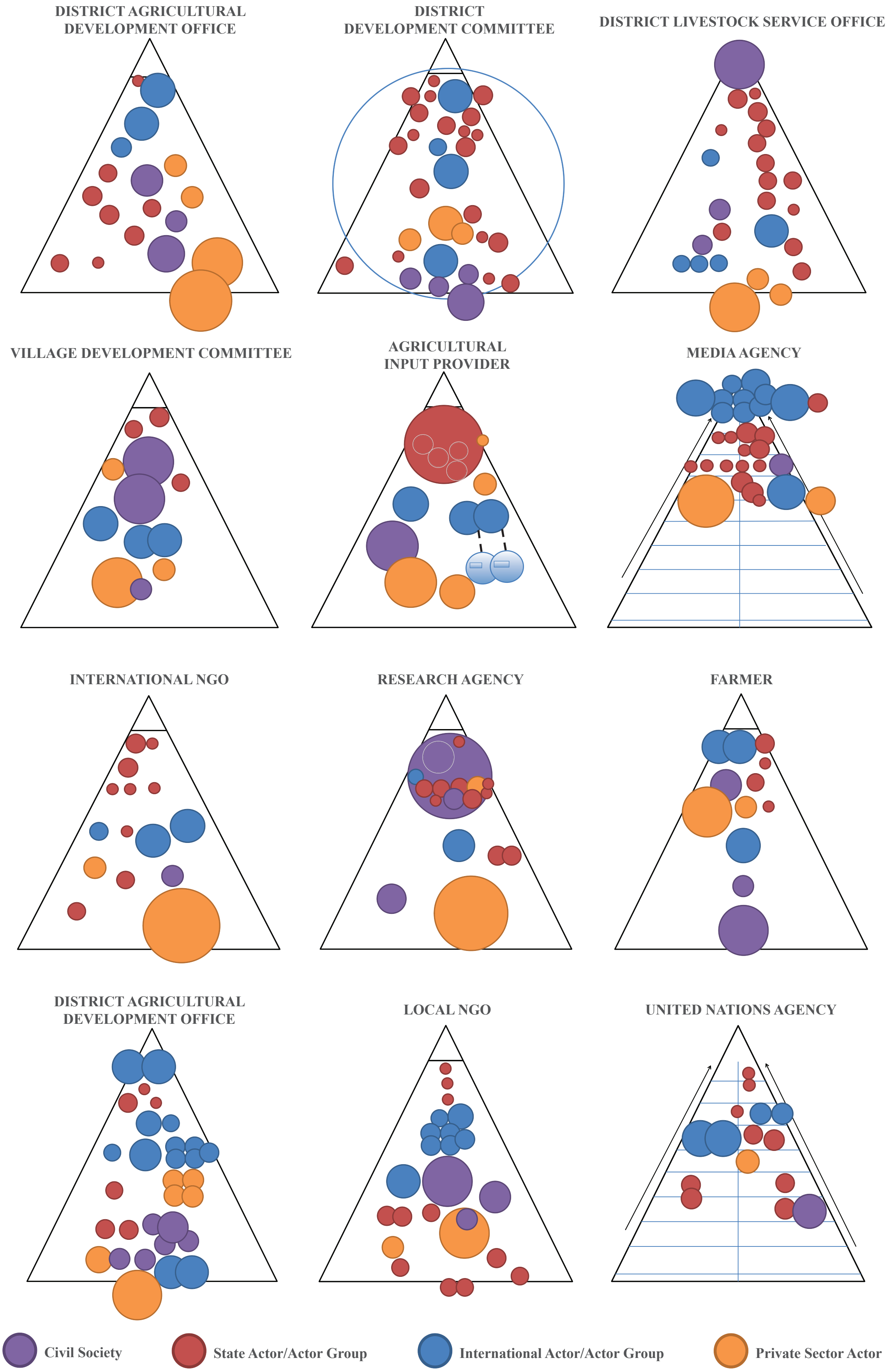


Figure 2. Example influence maps from Nepal field site

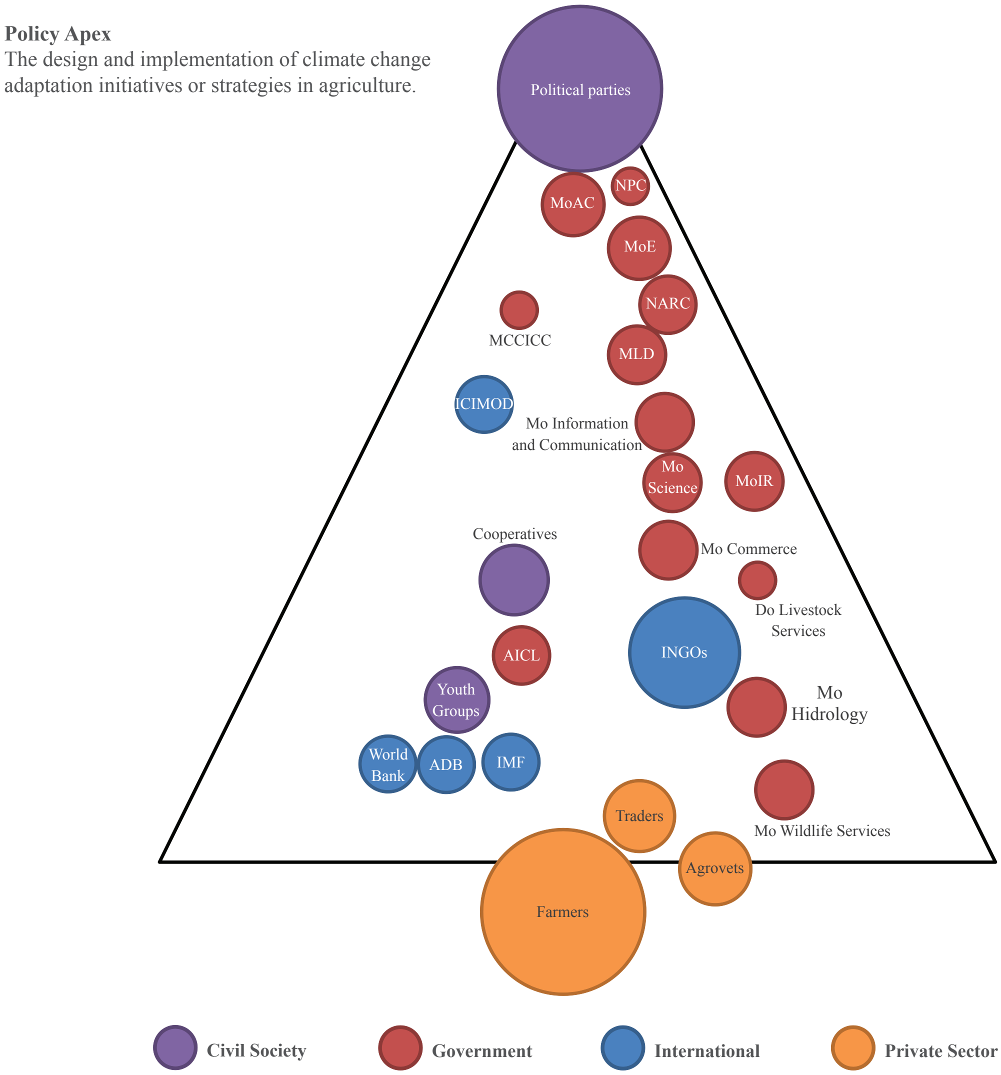


Figure 3. Detailed stakeholder influence map (Government of Nepal bureaucrat)

Note: Full actor/actor group names from most influential to least influential are as follows: political parties; National Planning Commission; Ministry of Agriculture Development (formerly, Ministry of Agriculture and Cooperatives); Ministry of Environment; National Agricultural Research Council; Multistakeholder Climate Change Initiatives Coordination Committee; Ministry of Foreign Affairs and Local Development (formerly, Ministry of Local Development); International Centre for Integrated Mountain Development; Ministry of Information and Communication; Ministry of Science, Technology and Environment; Ministry of Irrigation; Ministry of Commerce; Department of Livestock Services; Agricultural Cooperatives; International Non-Governmental Organizations; Agricultural Inputs Company Limited; Youth Groups; Nepal Department of Hydrology and Meteorology; The World Bank; Asian Development Bank; International Monetary Fund (IMF); Ministry of Forest and Soil Conservation (Department of National Parks and Wildlife Conservation); Traders; Agrovets (small-scale, private agricultural input providers and providers of veterinarian services); Farmers.

The most influential group in regard to climate change adaptation interventions in Nepal from the perspective of the respondent was "political parties." This includes principally the Nepali Congress (NC), Communist Party of Nepal (Unified Marxist-Leninist) (CPN-UML), and the Unified Communist Party of Nepal-Maoist (UCPN-M), the leading parties within the now dissolved Constituent Assembly (CA). The respondent identified Prime Minister Bhattarai as relevant, but only by extension of the political parties and not as a solitary actor himself. The respondent suggested that the political parties in Nepal were pervasive and active in "changing the scenarios in which all other [actors] operate." They hold key positions in Nepal's central-level decision making, including ministerial posts. The respondent stated, however, that "[political parties] are not always operating with the proper moral character" in terms of equity in decision making and accountability. The National Planning Commission (NPC), ranked second most influential from the respondent's perspective, was highly influenced by the political parties, as most NPC members are politically appointed.

The respondent indicated that the Ministry of Environment (MoE), the focal point agency for climate change in Nepal, was influential in terms of its potential to raise awareness of the impacts of climate change but that "it should be a line agency," with offices that extend beyond the central level and into District Development Committee (DDC) or Village Development Committee (VDC) levels. As it stands, MoE plays a coordinating role between other ministries with line-agency status, particularly that of the Ministry of Federal Affairs and Local Development (MoFALD), which coordinates DDC and VDC activities.

Other influential actor groups include the World Bank, ADB, and IMF, which leverage their own agendas through the transfer of funds to the Government of Nepal (GoN) ("we're giving you the money, so we'll decide how it's spent") and the Indian Government which the respondent suggests that the Nepalese try to emulate, influenced by their economic status, and a shared (similar) language and religion. The regional United Nations office location in India also contributes to India's geopolitical influence over Nepal according to the respondent.

In terms of the multilevel dynamics of climate change policy, the respondent sketched a small diagram to demonstrate key barriers to policy implementation. This was prompted by a series of follow-up critical systems heuristics questions after the influence mapping had taken place, aiming to identify key challenges in the adaptation policy process. This sketch has been digitized in Figure 4.

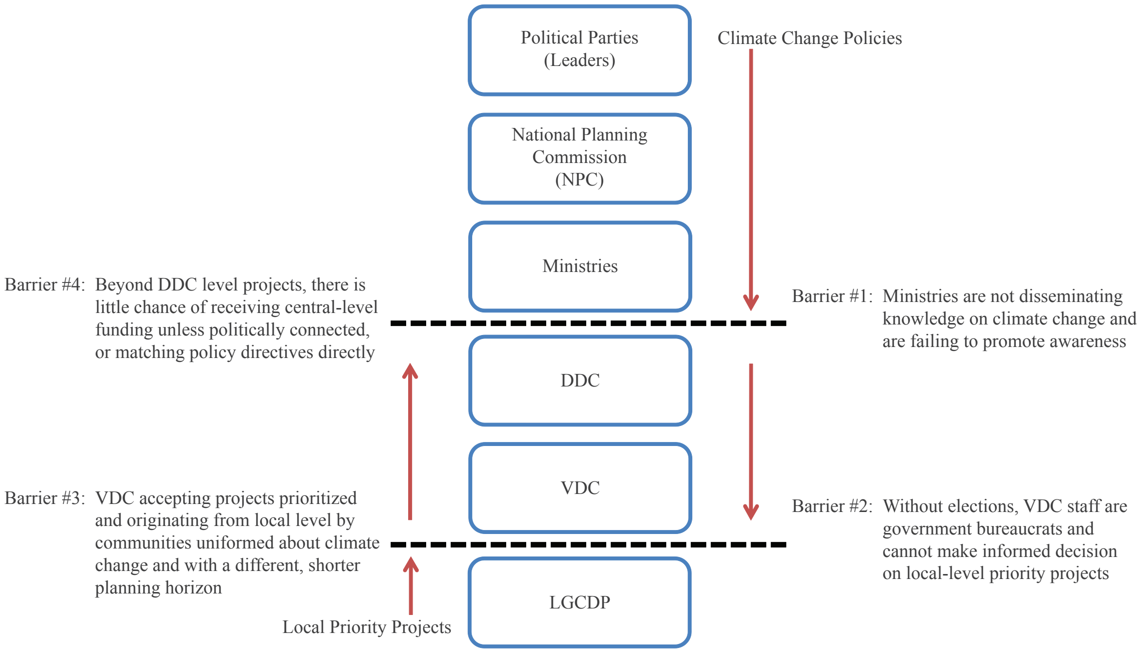


Figure 4. Barriers to adaptation policy processes according to a GoN bureaucrat operating at the collective action level

The barriers to policy development and implementation are fourfold from the perspective of the respondent.

1. GoN line ministries are not properly disseminating knowledge on climate change and are not promoting awareness to the extent needed. This is a product of both limited human resources for dissemination and incomplete understanding of climate change processes on the part of ministerial bureaucrats.
2. Following the elimination of local-level political elections, the duties of VDC bureaucrats have expanded to cover the roles previously held by publicly elected officials. This has led, in the eyes of the respondent, to an overextension of VDC Secretary duties and reduced ability to determine local-level development needs.
3. The third barrier is influenced by both of the previous circumstances. That is, the participatory local-level planning processes driven by Local Governance and Community Development Program (LGCDP) do not operate on a forward-looking, proactive planning mechanism. The LGCDP has been put in place to fill the void of local elected officials and provides the VDC office with prioritized projects for budgeting. They prioritize projects on the basis of current risk and development challenges (i.e., reactive planning) and are not properly versed in the forthcoming impacts or necessary considerations for climate-proofing development initiatives.
4. The fourth and final barrier identified by the respondent is related to the GoN budgetary process. VDCs and DDCs are each allocated a certain development budget by the NPC and

Ministry of Finance (via the MoFALD) to fund projects at the local level. Those projects that extend beyond the capacity of the VDC or DDC to fund (e.g., a bridge or irrigation system) are eligible to compete for a limited pool of central-level funds. The respondent suggests, however, that without a political connection at the central level, large-scale projects are rarely funded. Equity, then, in the distribution of funds for infrastructure or other large-scale projects required by climate change is difficult to ensure.

As noted at the outset, the above discussion is simply an example of the type of data produced from one individual viewpoint. The themes emerging in Figure 4 identifying policy barriers are unique only to this respondent, and are thus not necessarily reflective of wider prevailing views. When aggregated with other actor perspectives, however, it then would start to shape the narrative of power and influence in Nepal's agricultural climate change adaptation regime.

Measuring influence

From the detailed example above, we see that the MSIM stimulates discussion that extends beyond the relative influence between actor and actor groups in climate change adaptation regimes. It can help us to understand the institutional context in which actors are embedded and identify key tripping points in the policy process, among other things. But the perceived relative influence (i.e., the theoretical distance) between actors remains important. Viewed as an output in itself, influence maps can be analyzed to identify key organizations to engage in the policy development process, and can highlight actors/actor groups overlooked or neglected in this same process. As such, calculating the relative influence between actors as revealed in multiple iterations of the mapping activity can yield valuable, triangulated information regarding actor power and influence.

To create an influence score derived from multiple interviews, the frequency that actors were deemed "relevant" by interviewees was combined with their relative ranked position compared to other actors. The relative ranking score was established by counting actors/actor groups upwards from the bottom of each influence map and assigning the counted value as a ranking score. That is, the actor placed lowest on the influence map received a ranking score of 1, the second lowest a score of 2, the third lowest a score of 3, and so on. Actors/actor groups placed on the same level as one another received the same ranking score (e.g., "farmers" and "rural poor" placed side by side at the bottom of an influence pyramid would both receive a ranking score of 1). As there was no limit applied to the number of actors that the respondent could identify as "relevant," a different number of ranking levels could feasibly be identified by each respondent. As such, the number of ranked levels was identified for each of 14 respondents yielding an average of 14 ranked actor levels. The relative ranking was adjusted to this 14-actor equivalent by applying a ratio formula and solving for ‘Ra’. After applying this function, the highest possible ranking score was 14 and lowest 1 across all influence maps. The adjusted relative influence ranking is determined as follows:

$$R/n = Ra/14$$

Where ‘R’ represents the relative ranking (unadjusted), ‘n’ the total number of ranked levels identified by the respondent, ‘Ra’ the adjusted ranking score, and ‘14’ the average number of ranked levels over all 14 pilot iterations.

An initial ranking score (R) of 8, for example, among 10 ranked actors (n), is adjusted to a ranking (Ra) of 10 on a 14-actor scale. An excerpt from the table containing both ranking and adjust rankings is found below (Table 2).

Table 2. Example ranking and adjusted ranking table

	Respondent 1		Respondent 2	
Actor/Actor Group	Ranking (R)	Adjusted Ranking (Ra)	Ranking (R)	Adjusted Ranking (Ra)
Ministry of Agriculture Development (MoAD)	9	10	12	14
Ministry of Environment (MoE)	7	8	-	-
National Planning Commission (NPC)	5	5	12	14

The average adjusted ranking score ($\overline{x}Ra$) was calculated by dividing the summed adjusted ranking scores for each actor group by the total number of respondents identifying that actor group as relevant.

Combining the adjusted ranking score of each actor group with the frequency that the group was identified as “relevant” by the respondent is the final step in identifying a composite influence score. Two strategies are highlighted here for producing this frequency and rank composite score.

The first composite influence score approach is based on a direct summing of the frequency and adjusted ranking score. That is, the frequency that the actor group was included in the ranking is added to the mean adjusted ranking score.

$$I = F + \overline{x}Ra$$

Where ‘I’ represents the composite influence score, ‘F’ the frequency that the actor group was included in the ranking and ‘$\overline{x}Ra$’ the mean adjusted ranking score.

When calculated in this manner, the following influence scores are achieved, displayed alongside their respective actor/actor group (Table 3). In this scenario, the Ministry of Agriculture Development (MoAD) receives the highest composite influence score with regard to agricultural climate change adaptation policy across 14 iterations of the mapping exercise. The MoAD is followed closely by the Ministry of Environment and the National Planning Commission.

Table 3. Top influence ranking scores by actor/actor group (approach 1)

Actor/Actor Group	FREQUENCY	AVERAGE ADJUSTED RANKING	COMPOSITE INFLUENCE SCORE
Ministry of Agriculture Development (MoAD)	11	10	21.0
Ministry of Environment (MoE)	9	12	20.5
National Planning Commission (NPC)	8	12	20.0
INGOs (World Vision, IDE, CARE, WWF, Practical Action, Oxfam, Action Aid, and so on)	11	9	19.7
Climate Change Council (CCC)	5	13	17.5
Village Development Committee (VDC)	11	5	16.4
Indian Government	7	9	16.3
Traders	9	7	16.0
Political parties (NC, CPN-UML, UCPN-Maoist, CPN-Maoist, Madhesi Front, and so on)	8	8	16.0
United States Agency for International Development (USAID)	4	12	15.7
Nepal Agricultural Research Council (NARC)	6	10	15.7
Prime Minister (Bhattarai)	2	14	15.7

This first approach to determining an influence score, however, tends to favour outliers with respect to either the frequency identified or the mean adjusted ranking score. The inclusion of PM Bhattarai in Table 3 exemplifies this trend. The PM was identified only twice as "relevant" to the climate change adaptation policy process, but in those two instances the PM was ranked among the most highly influential actors. His mean adjusted ranking is 14 (the highest possible) and when combined with a frequency of 2 still ranks in the top influence scorers.

The second approach to producing a ranking score seeks to combine both ranking and frequency metrics into one composite score in an effort to reduce the impact of mismatches between frequency identified and mean adjusted rankings (as per the case with PM Bhattarai). In this approach, the adjusted rankings for each actor/actor group are summed and then divided by the maximum frequency score of 14 (i.e., the actor was identified as relevant by all respondents in the sample). This, in effect, includes in the calculation the instances that an actor/actor group was not identified as relevant (i.e., with a mean adjusted ranking of zero).

$$I = \Sigma Ra\ (n1\text{-}n14)/14$$

Where 'I' represents the composite influence score, 'Ra" the adjusted ranking, 'n' the respondent number, and 14 the maximum frequency score.

When calculated in this manner, the following influence scores are achieved, displayed alongside their respective actor/actor group (Table 4). The top four actors/actor groups remain unchanged between the two approaches. A few small changes, however, do occur. USAID and PM Bhattarai are eliminated from the top ranking list and the Ministry of Federal Affairs and Local Development (MoFALD) and DDC take their places.

Table 4. Top influence ranking scores by actor/actor group (approach 2)

Actor/Actor Group	AVERAGE ADJUSTED RANKING	COMPOSITE INFLUENCE SCORE
Ministry of Agriculture Development (MoAD)	10	7.9
Ministry of Environment (MoE)	12	7.4
National Planning Commission (NPC)	12	6.9
INGOs (World Vision, IDE, CARE, WWF, Practical Action, Oxfam, Action Aid, and so on)	9	6.8
Indian Government	9	4.6
Political parties (NC, CPN-UML, UCPN-Maoist, CPN-Maoist, Madhesi Front, and so on)	8	4.5
Traders	7	4.5
Climate Change Council (CCC)	13	4.5
Village Development Committee (VDC)	5	4.3
Nepal Agricultural Research Council (NARC)	10	4.2
Ministry of Local Development (MLD)	9	4.0
District Development Committee (DDC)	6	3.9

There are several other approaches that the analyst could choose in producing an influence score. A weight, for example, could be applied (50% frequency, 50% adjusted ranking; 25% Frequency, 75% adjusted ranking, and so on) to place equal or more/less importance on the variables. Ultimately, the means by which an influence score is calculated is less important than the qualitative trends that emerge from the influence maps.

The results that we see above include responses from the complete pilot sample set (n=14), actors operating at the local, district and central level. Analysing the data from the perspective of a select subset of actors can also yield valuable results. For example, Table 5 holds the results of the mapping exercising using only the responses from local (operational level) actors (n=5) representing community members, local NGOs, VDC personnel, and private sector input providers. Actors in this sample responded to the local-level policy apex of “The ability to produce food, earn income, or subsist when the weather changes.”

We see that a very different top list of influential actors is identified using this local actor subset. Traders, INGOs, and the VDC are deemed most influential from the perspective of these actors. Actors previously absent from the complete sample set (n=14), including local NGOs, community leaders, the Agricultural Service Center and the Department of Livestock Services, are now visible in the rankings.

Table 5. Top influence ranking scores by actor/actor group from the perspective of local- and district-level respondents (approach 2)

Actor/ Actor Group	AVERAGE ADJUSTED RANKING	COMPOSITE INFLUENCE SCORE
Traders	8	6.7
INGOs (World Vision, IDE, CARE, WWF, Practical Action, Oxfam, Action Aid, and so on)	8	6.5
Village Development Committee (VDC)	10	6.1
Local NGOs	8	6.0
Indian Government	7	5.6
Political parties (NC, CPN-UML, UCPN-Maoist, CPN-Maoist, Madhesi Front, and so on)	6	5.0
Ministry of Agriculture Development (MoAD)	12	4.8
Community leaders	11	4.4
District Agricultural Development Office (DADO)	11	4.3
Agricultural Service Center	11	4.3
Department of Livestock Services (DoLS)	10	4.1
National Planning Commission (NPC)	10	4.0

Note that it is important to recognize that there is often as much variability in opinions on a particular social topic *within* a social group as there is *between* social groups. The analyst must use caution in drawing conclusions from aggregated data produced from actors deemed to exist within the "same stakeholder group." To account for the plurality of perspectives and identities, MSIM analysis should be complemented with rigorous analyses of respondent characteristics and utilize narratives and discourse analyses, for example, that provide an indication of important value sets and world views.

While the identification of highly influential actors is valuable for engagement and lobbying in the policy arena, the identification of those actors/actor groups that are deemed least influential is equally descriptive. Table 6 identifies the actors with the lowest influence scores (using calculation approach 2) among those actors/actor groups identified as "relevant" by six or more respondents.

Table 6 shows that 'farmers' are the least influential of the relevant stakeholders in the agricultural climate change adaptation policy development and implementation process. Farmers were identified by 8 of the 14 respondents as relevant, and received an average adjusted ranking of 1.9, which combined with this frequency in approach 2 produces an influence score of 1.1, the lowest of all highly relevant actor groups. Nepal's Agricultural Inputs Company, responsible for subsidized fertilizer distribution in the country, received an influence score of 2.7 followed by Agrovets (2.7), agricultural cooperatives (3.0), and community leaders (3.3).

Table 6. Lowest influence ranking scores by actor/actor group (approach 2)

Actor Group	FREQUENCY	AVERAGE ADJUSTED RANKING	COMPOSITE INFLUENCE SCORE
Farmers	8	1.9	1.1
Agricultural Inputs Company Ltd (AICL)	7	5.4	2.7
Agrovets	6	6.3	2.7
Agricultural cooperatives	9	4.6	3.0
Community leaders	6	7.7	3.3
Local NGOs	8	6.0	3.4
Ministry of Irrigation (MoIR)	6	8.0	3.4
District Development Committee (DDC)	10	5.5	3.9
Ministry of Local Development (MLD)	6	9.4	4.0
Nepal Agricultural Research Council (NARC)	6	9.7	4.2
Village Development Committee (VDC)	11	5.4	4.3

This analysis of least influential—yet highly relevant—actors directs the analyst towards actors/actor groups that are potentially marginalized in the policy development and implementation process. That is, those actors that are directly impacted or serve critical roles in the policy process, but do not leverage influence in any meaningful way.

Discussion

Multilevel stakeholder influence mapping proves a useful tool for understanding cross-level power and influence dynamics and perspectives between actors/actor groups, and visualizing those relationships in a simple, straightforward methodology. The two major adaptations to the existing IIED influence-mapping tool (i.e., the translating of the policy apex across actor levels and the embedding of the tool in a semi-structured interview format) have been useful in capturing perceptions of power dynamics across levels and highlighting inequalities that exist within adaptation policy regimes. The drastic change in the actors/actor groups ranked highly influential by respondent sets operating at different actor levels speak to the former (cross-level perspective) and the consistent ranking of 'farmers' as least influential in the policy process to the latter (inequalities).

The pilot results also yield fruitful considerations for strategic entry into climate change policy regimes in Nepal, and key areas for improving equity within the policy stages. Specifically, the MoE, MoAD, and NPC are perceived to be among the most influential actor groups in the climate change adaptation regimes in agriculture, even when the method for determining an influence score is adapted. INGOs also rank consistently high in their perceived influence, suggesting, as other authors have pointed out, that a robust donor and INGO network has emerged in Nepal due to persistent instabilities in government and poor service delivery of development resources (Paudel 2010; Rai and Paudel 2011). Geopolitical considerations identified in the mapping suggest that the Indian government's policy portfolio is highly influential on Nepal's agricultural sector. Particularly in the border regions, subsidies and other input distortions for Indian farmers impact directly on Nepal's rural producers given the open border and free movement of goods between the two countries.

In the process of highlighting these important instances of power and influence, several methodological lessons were drawn out regarding, most notably, (1) the framing of definitional boundaries of power, (2) limitations of 'perspective-based' data, and (3) the potential for theoretical distance measurements.

Ubiquity of power

In the same way that adaptation is operationalized via complementary concepts like vulnerability, resilience, risk, exposure, and sensitivity, power too is dependent upon the related concepts of influence, authority, legitimacy, and legality, among others. The concept of power 'bases' (i.e., the sources of exercised power) first emerged in 1959 through the work of French and Raven. These authors suggested that power could be separated into distinct forms or 'bases,' including reward, coercion, legitimacy, referent, and expert (French and Raven 1959). Several authors have since built on these initial bases (Ulrich 1983). Bases today include condign power (i.e., force based), coercion, compensation (i.e., resource and reward), condition (i.e., persuasion or consensus), personality (i.e., charisma), positionality, and expertise (i.e., knowledge).

Simply referring to 'power' or 'influence' without further defining the terms in the framing, the MSIM exercise can produce unclear conceptual boundaries for the respondent (and the analyst). Respondents are likely to be biased towards the identification of highly visible power bases (e.g., a Minister determined to be highly influential due to his or her position in government). Less-visible exercises of power including 'expertise' or 'coercion'—which can be most effective—may not be recognized (or hidden) by (to) the respondent.

Yet this is not necessarily problematic. By leaving definitional boundaries vague, the respondent's perspective as to what constitutes power or influence is revealed; a valuable result in itself. Ultimately, however, the framing of the exercises will depend on the objectives of the analysts. In the event of multiple case studies, for example, a well-articulated definition of power and influence may be selected to facilitate comparative analysis. Alternatively, in one-off studies, the analyst may choose to leave boundaries vague, or to conduct exploratory interviews prior to the exercise to determine contextually appropriate definitions of power or influence.

Perception-based analysis

The MSIM method provides the analyst with perceptions-based data regarding the relative power and influence of actors in Nepal's adaptation regime. This does not necessarily speak to actual influence or capability of these agencies to 'successfully' develop and influence the policy process. As such, MSIM maps rely on triangulation between actor and actor groups operating at different user levels as a means of validation or results verification. Empirical evidence like budget allocations, results of decision-making processes (e.g., resulting policy objectives or priorities), participation in decision-making fora and so on can be used alongside MSIM maps to confirm or further clarify the sources or manifestations of power/influence.

Theoretical distance

The visual format of the MSIM method allows individual perceptions to be systematically aggregated to obtain the mean, mode, average, and variance of perceptions of the relative influence of actors for different social groups and for the entire country. In the methodology outlined in this paper, this is accomplished by drawing on the relative ranking of actor groups. But it could also be accomplished using Euclidian distance metrics which allow greater or lesser distances to contribute to the overall results as with preferential voting rather than with just a ranked list. This "theoretical distance" concept could be facilitated with a simple influence mapping software, for example.

Other key methodological considerations for the application of the MSIM tool include: (1) the recognition of the potentially sensitive nature of power/influence mapping (i.e., the need to ensure respondents anonymity), (2) the time required for respondents to undertake the activity and associated interview questions (e.g., the interviews lasted on average 1.5 hours), and (3) the focus on 'actual' behaviour between agents (i.e., the mapping captures the way that things *are*, and can be compared with intended institutional and actor structures through document and policy analysis for the ways that they *ought to be*).

Implications

It should be noted that the results and discussion above are based on a small sample of actors in Nepal's climate change adaptation regime. The objective of the influence-mapping portion of this research was to test the feasibility of the MSIM method and to draw out key methodological considerations, not to produce unequivocal mapping results. Consequently, one must be careful not to overextend the implications of these findings using MSIM maps alone. As suggested in the introduction to the Nepal case study, the implications that follow here contain assertions that have been informed by the MSIM maps, semi-structured in-depth interviews with actors across various levels of Nepal's climate change adaptation regime, and a comprehensive policy content review of Nepal's agriculture and climate change sectors (See CCAFS Working Paper No. 44 [Sova and Chaudhury 2013]). In this context, the preliminary MSIM mapping results led the analyst towards exploring several areas of the policy process for which power inequalities between vulnerable populations and influential decision-makers were identified (i.e., the 'key moments and mechanisms'). The objective of the following section is to explore these key policy areas—mainly, ambiguous central-level policy objectives, biased vulnerability assessment processes, and the 'rendering technical' of adaptation decisions—and to suggest ways in which less powerful, yet highly invested actors in Nepal's adaptation regime, can be incorporated into the policy development process.

Ambiguity in policy objectives

Empirical evidence of the results of decision making in adaptation regimes can be collected through content analysis of relevant policy documents. Six central-level adaptation policies were identified in Nepal, including the National Adaptation Plan of Action (2010), Climate Change Policy (2011), Pilot Program on Climate Resilience (2010), Local Adaptation Plans of Action 2011, UNFCCC Initial communication (2004), and the Poverty-Environment Initiative (2010). Content analysis on these documents yielded a total of 33 unique objectives or priorities. Each of the documents contains contributions from Nepal's Ministry of Science, Technology and Environment (MoSTE), an actor group consistently ranked highly influential by the full sample of respondents.

"Improved biodiversity and natural resource management," "capacity development," and "vulnerability assessments" are among the most frequent of Nepal's stated adaptation policy objectives. Wide, sweeping policy objectives like these are a necessity at this constitutional planning level. However, unlike 'traditional' sectors, institutions that transform these high-resolution objectives into recognizable actions at lower user levels do not yet exist for climate change. The Ministry of Science, Technology and Environment in Nepal, the country's UNFCCC focal agency, is a central-level coordinating body which has no bureaucratic or political representation beyond the capital city (as evidenced by its exclusion among highly influential actors from the perspective of local-level respondents – Table 5 above). It is, then, the responsibility of existing line agencies like the Ministry of Agriculture Development, burdened by dwindling budgets and insufficient human resources, to ensure that these stated policy goals are properly translated at 'operational' levels.

Recognizing this inherent limitation, Nepal has begun a process of piloting Local Adaptation Plans of Action (LAPAs) with the support of the UK Department for International Development (DfID) and a host of local NGOs. The aim of the LAPAs is to identify local adaptation needs that match broad priorities identified under the NAPA and to integrate these priorities through bottom-up approaches to adaptation policy mainstreaming. Given that communities view climate change alongside existing, multiple, and complex livelihood stressors (and on different temporal scales to that of national planning horizons), LAPAs are a welcome—and necessary—addition to Nepal's adaptation regime. Yet a critical assumption in the implementation of LAPAs is that sufficient capacity exists within local bodies (e.g., VDC and DDC offices) to incorporate climate resilience planning and project implementation. Spread thin by the lack of local elections (abolished in 2002), VDC secretaries and other local staff lack the strategic capacity and resources necessary for this climate policy integration (CPI) process.

Action: Community representation can help to ease the burden of CPI, but will require re-establishing local-level elections or devising other community planning interfaces. This is a position supported by Nepal's Election commission. A decade-long election void persists due to central-level political infighting over the ratification of a new GoN Constitution and a modified federal administrative structure. Impending change in Nepal's administrative structure highlights the need for adaptive and flexible adaptation institutions. As the adaptation needs of communities are immediate and the political and administrative will to renew elections distant, interim support is necessary. The Local Governance and Community Development Program (LGCDP), referenced in the detailed mapping example in the 'results' section above, should thus be extended and integrated more closely (i.e., formally recognized) within the LAPA process; that is, should the envisioned LAPA process continue to rely—to the extent currently envisioned—on government administrative units as a mechanism through which community voices are channelled. LGCDP has established social mobilizers in most districts and protocols for engaging marginalized populations in the development planning process.

Vulnerability assessments

Climate change fund and programme allocation in Nepal is based on vulnerability assessments conducted in the early phases of the National Adaptation Programme of Action (Nepal, 2010b) development process. Often the first step in determining adaptation resource distribution, the way in which vulnerability assessments are implemented and the variables included or excluded (and the various weights assigned to those variables/indices), will have considerable impact on who/what is considered for resource allocation and, by extension, who will partake in or be impacted by the adaptation decision-making process. Vulnerability assessments in Nepal were conducted by the College of Applied Sciences (CAS-N) in consultation with MoSTE and the NAPA project team, all of which were determined highly influential actors themselves or associated with actors/actor groups deemed highly influential in MSIM. The vulnerability assessment process outlined in "Climate change vulnerability mapping for Nepal" (Nepal, 2010a) consists of climate risk/exposure, sensitivity and adaptive capacity maps derived from national district-level databases overlaid on Nepal's 75 districts. Analysis of the vulnerable assessment as a "key mechanism" (step 8 in the IIED influence mapping methodology) provides important lessons in terms of the agricultural adaptation agenda setting and the knowledge-policy interface[3].

Take cereal production in Nepal's NAPA overall vulnerability index rating as an entry point into this discussion. Rupandehi, this paper's study district, is considered the top cereal-producing district in Nepal, accounting for a combined 240,668 metric tonnes of edible cereal (rice, maize, wheat, millet, barley, buck wheat) in 2010, followed closely by the Jhapa district with 213,093 combined metric tonnes of cereal production (Statistical Information on Nepalese Agriculture, Agri-Business Promotion Statistics Division, 2010/11, Ministry of Agriculture and Cooperatives-MoAC). These top two producing agricultural districts are among the five districts in Nepal deemed "very low" in terms of vulnerability to climate change. This has obvious consequences for adaptation fund allocation in these highly productive agricultural districts, so it is worth investigating the metrics for determining Rupandehi's vulnerability score.

The overall vulnerability rankings for Nepal were produced through an equal weighing (33.33%) of three separate indices: (1) Combined Sensitivity Index; (2) Combined Multiple Adaptation Capability Index; and (3) Combined Risk/Exposure Index. The breakdown of the Combined Risk/Exposure Index can be found in Box 4 below[4] as it will be used for more detailed discussion.

Box 4. Overview of the Combined Risk Exposure Index, one of three elements that combine to produce composite vulnerability scores in Nepal

Combined Risk Exposure Index = (Landslide risk index) {1/6} + (Flood Risk Index) {1/6} + (Drought Risk Index) {1/6} + (GLOF[a] Risk Index) {1/6} + (Ecological Risk Index [Per Hectare Forest Dependence + HPI[b] Index + Accessibility Index] {1/6} + (Rainfall and Temperature Index) {1/6}

a GLOF: Glacial Lake Outburst Flood
b HPI: Human Poverty Index
Source: Nepal, 2010a.

3. Note that it would be easy for the reader to infer here that "vulnerability" is inherently a product of a "lack of influence." And it is to a certain extent. Consider, for example, that a lack of participation in decision-making processes can have a negative impact on the effectiveness of the intervention ultimately chosen. Yet, the MSIM tool aims only to draw out who is in a position to make decisions regarding adaptation responses, and in itself does not get at who is likely to be positively or negatively impacted by the results of that power structure. This example of Nepal's vulnerability assessments is intended to articulate the potential consequences of power inequalities in decision making. Measures of success and "winner and loser" constructs as shown in this example are produced by the CSH questions in which the exercise is embedded in, but they are not the intended visual outcome of the tool.

4. Details of the composition of each of these indices can be found in Climate Change Vulnerability Mapping for Nepal (Nepal 2010a).

It is important to recognize that the overall vulnerability rankings for Nepal are designed to indicate vulnerability to a variety of stressors across multiple sectors and activities. Consequently, variables most relevant to agriculture alone (i.e., temperature and rainfall, flood, drought) can be buried within composite indices. Rainfall and temperature risks indices, for example, represent 1/6 (rainfall and temperature risk exposure, see Box 4) of 1/3 (combined risk exposure) of the overall vulnerability ranking for Nepal's districts. As a result, vulnerability in agricultural systems can be understated or diluted by the inclusion of all-inclusive sector variables.

In recognition of this, Risk Specific Vulnerability Indices are also included in the MoSTE Vulnerability Mapping document to compensate for this aggregation of risks, sensitivities, and adaptive capacities found in combined vulnerability indices. Risk specific indices, for example, were produced for (1) rainfall and temperature vulnerability, (2) ecological vulnerability, (3) landslide vulnerability, (4) flood vulnerability, (5) drought vulnerability, and (6) GLOF vulnerability. The risk specific indices combine, in equal parts (33.33%), a socioeconomic index, a combined adaptation index, and a risk specific sub-index.

These Risk Specific Vulnerability Indices have been used in the document to identify "prioritized districts for adaptation planning" (Nepal 2010a), a list in which Rupandehi has not been included. Temperature and rainfall have not been explicitly included in the list of "risk/exposure" areas for which districts have been prioritized, while the remaining five 'specific risks' (ecology, landslide, flood, drought, and GLOFs) have. While flood and drought are inextricably linked with temperature and rainfall, they represent the extremes (and intensity) of temperature and rainfall and do not address more progressive and equally risky trends in temperature increases and rainfall patterns. Considering that many crops grown in the Terai region hover dangerously close to temperature and moisture thresholds, the risk from temperature and precipitation trends alone (i.e., without reference to the 'downstream' risks of drought and flood) are important indicators of vulnerability.

Action: The impacts of crop loss from a threshold temperature or rainfall event, among these, the highest cereal-producing districts in Nepal, would have ripple effects across Nepal's economy and impacts on the wellbeing of both its rural and urban populations[5]. As such, vulnerability assessments that reflect the dangerous downstream impacts of crop loss by incorporating temperature and precipitation more centrally in composite indices should be

5. It is difficult to separate out political vulnerability from other biophysical and socioeconomic vulnerabilities, as articulated in this example. Biophysical and socioeconomic conditions—particularly in a place like Nepal with difficult topography and persistent caste structures—are often responsible for framing the factors that grant access to the decision-making process, be it physical distance or social norms.

considered. Furthermore, temperature and rainfall risk in the referenced assessment have been determined from a 2009 Practical Action study that monitored data from 44 temperature and 166 precipitation stations in Nepal from 1976–2005 to draw out forward-looking trends in temperature and precipitation (both seasonal and annual) using linear regression. The linear extrapolation of observed precipitation and temperature trends as a measure of risk/exposure can produce potentially misleading results. The effects of accumulating greenhouse gases (GHGs) on precipitation and temperature are that changes in climate systems will outpace existing trends, producing often unanticipated impacts on the climate system though complex feedback loops. Forecasted precipitation trends constructed using downscaled General Circulation Models (GCMs) and IPCC Special Report emissions scenarios (SRES) (IPCC 2000) that take these factors into account, although imperfectly, provide a sturdier foundation on which to assess temperature and precipitation risk and exposure.

Anti-politics of adaptation

The final policy area for further examination emerging from the MSIM tool is the trend towards purely "expert-level" engagement in adaptation regimes. Inherent uncertainties in climate impacts in Nepal have led to the tendency to "render technical" (i.e., delegate decision making to 'experts')—to borrow a term from Tania Murray-Li (Murray-Li 2007)—decisions surrounding adaptation measures. That is to say, if local communities are entirely unaware of the impacts of climate change, how can they establish 'interests' with regard to their own livelihood responses? Knowledge and expertise, then, were deemed key power bases by MSIM respondents, a trend which is explored here in the context of NAPA development.

The NAPA, the cornerstone document of Nepal's adaptation regime, was structured according to guidelines developed by the LDCs' Export Group (LEG) and was implemented by MoSTE, the Embassy of Denmark, DfID, the Global Environment Facility (GEF), and the United Nations Development Programme (UNDP)-Nepal. Six thematic working groups (TWG) were developed in the NAPA process and managed by an advisory board including bureaucrats from the Ministry of Environment, National Planning Commission, Ministry of Agriculture and Cooperatives, Ministry of Forests and Soil Conservation, Ministry of Physical Planning and Works, Ministry of Energy, Department of Hydrology and Meteorology, Ministry of Health and Population, UNDP-Nepal, Federation of Community Forest Users, Institute of Engineering, and the Association of District Development Committees. Finally, a leading project team was established to ensure timely development of the NAPA and consisted of five external "climate change specialists," and a group of managers and directors from the Ministry of Environment.

In November 2009, these TWG and project team members conducted three separate NAPA 'transect appraisals' in Western, Central, and Eastern development zones, respectively, to produce microlevel impact assessments. These assessments were then referred back to the TWGs for a prioritization of adaptation responses (Nepal 2010b).

The result of this techno-centric process is USD 350 million allocated towards implementing Nepal's NAPA based on less than four weeks of consultation with select local stakeholders in a sample of Nepal's districts. The limited consultation with local stakeholders in the NAPA process is reflective of a wider trend in Nepal. The country has been embroiled in on-going political conflict which has led to violent revolt, frequent changes of leadership and, at present, has left the country void of a working parliament and "between" constitutions. At the heart of this conflict is an entrenched caste system, which breeds a sense of fatalism amongst Nepal's indigenous, Dalit and 'untouchable' classes (Bista 1991). As such, the proliferation of climate change policies and institutions since 2010 has occurred in the context of technocratic and bureaucratic rule, providing space (and opportunity) for multilateral donors and INGOs to fill a critical decision-making void.

Action: Adaptation regimes in Nepal require renewed focus on building national (and subnational) ownership over adaptation regimes and recognition that, at present, CPI/mainstreaming is occurring into existing inequality-producing structures driven by externally imposed development regimes. Adaptation must be brought back into the field of political debate and not "rendered technical" so that local stakeholders—not donor reporting matrices—determine what is considered success in adaptation, and who ought to be benefited. This can be facilitated through implementing a shared-learning dialogue (SLD) approach as recommended by Dixit et al. (2011) which combines top-down scientific and technical considerations with bottom-up, context-specific considerations and development objectives of vulnerable stakeholders. The LAPA process has rightly adopted such an approach, yet it must be careful in recognizing that incremental improvement in the service delivery of "development" activities at local levels reflects the inseparable nature of complex, multiple livelihoods stressors, and is not necessarily at odds with fixed definitions of "adaptation" at higher levels. Also, the NAPA document—which remains the apex adaptation planning document in Nepal—must be seen as a living document that is informed by LAPA process and amendable based on the results of the more robust SLD process that the LAPA is able to provide. Given the short period of community-level stakeholder consultation in the NAPA development process, policy learning must occur in both directions, with the LAPA serving to reshape the NAPA as time and field-level realities change.

Areas for continued research

Several areas of the adaptation policy process warrant further investigation for their vulnerability to—or production of—unequal power dynamics. They are included here in summary form.

1. **Discourse analysis:** Hermeneutics, or the study of texts, can be useful in elucidating instances of power creation or reinforcement in written documents, a principal medium through which discourses are developed, reinforced, and maintained. Discourses, in turn, are important sources of power. Research in the area of adaptation policy analysis should consider the way in which written adaptation policies reinforce inequalities or produce new inequality-producing mechanisms. Spoken discourses around climate change also represent an important research need in this area.

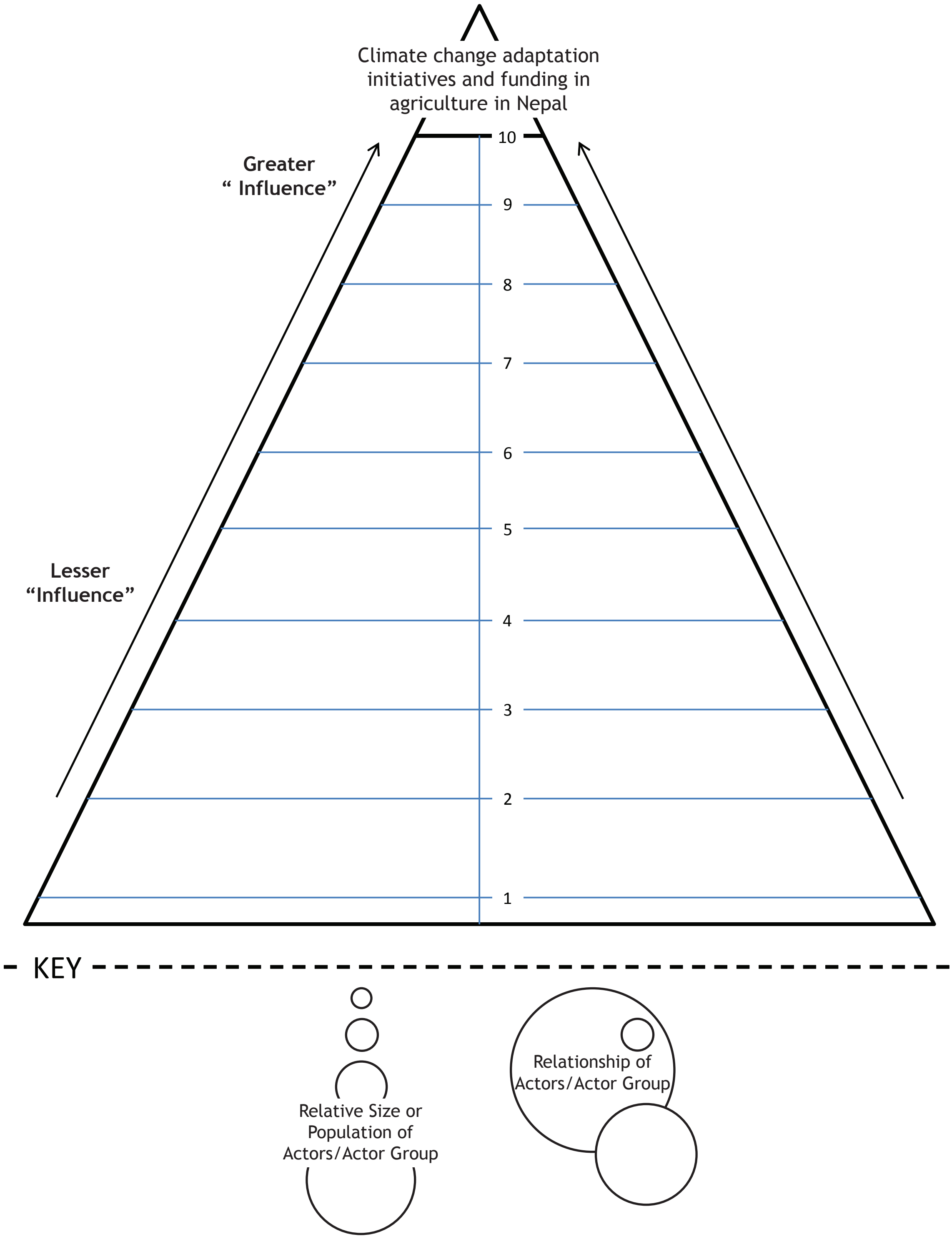
2. **Decentralization:** Decentralization or devolution of decision making is an important factor in decision making in Nepal, and thus an important factor in determining power relationships. As suggested by Heller (2001), however, decentralization does not always go hand in hand with the devolution of decision-making power. That is, securing local political representation is a way of extending control and the creation of subjects. Research in the area of decentralization of administrative decision making can contribute to our improved understanding and progress towards equitable adaptation institutional structures.

3. **Political ecology:** Given the cross-cutting nature of climate change, the factors that determine power in decision making in this sector can be the products of history, culture/worldview, policies/rules/procedures, organizational structure (architecture), demographics, geopolitics, and so on. This multitude of factors contributes to an understanding of which power bases are viable in a given circumstance. They are, collectively, the “things” of an emerging “political ecology” community of practice (Robbins 2011). A political ecological perspective can be useful in framing adaptation decisions within the broader context in which they are embedded; a multilevel approach recognizing these complexities is needed in adaptation research.

4. **Actor networks:** Power is often maintained through networks of actors, reinforced, or undermined through the formation or dissolution of alliances between actors wielding various competing or complementary resource bases. Research into how actor networks develop around power structures (or vice versa), with specific reference to actor interests and resource bases—funding, most notably—is needed to expand our understanding of how power is created, reinforced, or undermined in complex multistakeholder, multilevel systems.

5. **Conceptual framework:** The challenge in studying power in any system is its ubiquity. As such, a conceptual or analytical framework that facilitates this process is recommended. The Earth Systems Governance (ESG) project, a ten-year initiative of the Earth System Science Partnership (ESSP), identifies power as a key cross-cutting theme in its research agenda. Despite advising against an exclusive definition of power, ESG suggests that one potentially useful way of conceptualizing the topic is to consider Steven Lukes's dimensions: decision making, agenda setting, and preference shaping (Lukes 2005). This conceptual or analytical framework is particularly useful since it recognizes more nuanced manifestations of power, which assists in understanding its implications in climate change adaptation policy. Mainly, Lukes addresses how certain actors are able to "shape or re-define the context in which actors are engaged, or if 'the game' is to be played at all" (Biermann et al. 2010). Considering the uncertainties and lack of consensus regarding proactive measures to address climate change, these agenda setting and preference-shaping dimensions of power are perhaps more descriptive than decision making alone (i.e., adaptation projects chosen or budget allocations to adaptation programmes/projects) and could be considered as a potential conceptual framework for advancing our understanding of power dynamics in adaptation (and other) regimes.

Appendix 1. Example MSIM power-mapping board



Appendix 2. MSIM actor list

Place a 'Tick' next to the actor/actor groups MOST RELEVANT to agriculture and/or climate change in Nepal

Central Government	District/Local Government	Civil Society	NGOs/INGOs/Associations	Bilateral/Multilateral	Private Sector
President (Yadav)	Department of Agriculture	Political Parties (NC, CPN-UML, UCPN-Maoist, CPN-Maoist, Madhesi Front, and so on)	INGOs (World Vision, IDE, CARE, WWF, Practical Action, Oxfam, Action Aid, and so on)	***Bilateral* *(Country-Nepal*)**	Agrovets
Prime Minister (Bhattarai)	Department of Cooperatives	Political Party Leaders (Dahal, Baidya, and so on)	NGOs (local)	USAID	Traders
National Planning Commission	Department of Food Technology and Quality Control	Community Leaders	UN Agencies (UNEP, UNDP, FAO, UNFCCC)	DfID	Consumers
Constituent Assembly	Department of Livestock Services	Women's groups	International Centre for Integrated Mountain Development (ICIMOD)	GIZ	Agroindustries
Multistakeholder Climate Change Initial Coordination Committee (MCCICC)	Department of Hydrology and Meteorology	Youth groups	Himalayan Climate Initiative	DANIDA	Development banks
Climate Change Council (CCC)	Department of Forest	Savings and Loans groups	Trade Associations	NORAD	
Nepal Agricultural Research Council (NARC)	Department of Forest Research and Survey	Religious Groups		JICA	
Ministry of Environment	Department of National Parks and Wildlife Conservation	Agricultural Cooperatives		Indian Government	
Ministry of Forestry and Soil Conservation	Department of Soil and Watershed Management	Consumer Groups		Chinese Government	
Ministry of Agriculture and Cooperatives (Development)	Department of Irrigation	Local NGOs		***Multilateral***	
Ministry of Commerce and Supplies	Department of Land Reform and Management	Rural Poor		The World Bank	
Ministry of Information and Communication	Department of Local Infrastructure Development and Agricultural Roads	Farmers		Asian Development Bank (ADB)	
Ministry of Land Reform and Management	Department of Women Development	Marginalized People		International Monetary Fund (IMF)	
Ministry of Local Development	District Development Committee (DDC)				
Ministry of Science, Technology and Environment	Agricultural Service Center				
Ministry of Women, Children and Social Welfare	District Agricultural Development Office (DADO)				
Ministry of Irrigation Committee (VDC)	Village Development				
Ministry of Federal Affairs, Parliamentary Affairs, Constituent Assembly and Culture	VDC Secretary				
Agricultural Inputs Company Ltd. (AICL)	Local Governance and Community Development Programme (LGCDP)				
Nepal Seed Company	Ward Citizen Committee				
Poverty Alleviation Fund	Ward President				
Alternative Energy Promotion Center (AEPC)					

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