

# Multi-level Stakeholder Influence Mapping: Visualizing Power Relations Across Actor Levels in Nepal's Agricultural Climate Change Adaptation Regime

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**Abstract** Where power lies and how it is conceived in studies of governance and institutions is often not discussed. This is due to the ubiquitous nature of the topic. Power is shaped by a variety of institutional factors, including the architecture of governing structures, questions of scale and level, and access to key resources including knowledge and capital, among other factors. To date, there are relatively few tools available that allow policy makers, researchers, and development practitioners to render these power dynamics explicit and thus take steps to mitigate the potentially deleterious effects of power orientations. This paper proposes a methodology, multi-level stakeholder influence mapping (MSIM), for elucidating power dynamics between actors in complex system regimes. MSIM departs from existing power mapping techniques in that it relies on individual interviews conducted across multiple actor levels and utilizes a participatory mapping process for shared system boundary critique. MSIM was piloted in Nepal's agricultural climate change adaptation regime with actors from the central, regional, and local operational levels. The results suggest that without proper consideration of the role of power in agricultural adaptation regimes, the resulting interventions will likely be insufficient in catalyzing adaptation pathways and moderating the negative impacts of climate change. Furthermore, power analyses produced from the perspective of a single actor level or

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respondent type can risk sub optimization of adaptation outcomes and can misdirect the lobbying efforts of those agencies utilizing mapping outputs.

**Keywords** Climate change · Adaptation · Agriculture · Nepal · Power · Influence · Mapping

## Introduction

How power is conceived in studies of governance and institutions is often not discussed (Biermann et al. 2010; Barnett and Duvall 2005; Lebel 2006). This is due to the ubiquitous nature of the topic. Power is shaped by a variety of institutional factors, including the architecture of governing structures, questions of scale and level, and access to key resources including knowledge and capital. Explicitly acknowledging the role of power in complex system regimes can improve our understanding of its origins and manifestations, and lead to improved policy and institutional design.

This paper asks the question: “How can we meaningfully visualize, and analyze empirically, the power of different actor groups with respect to a given policy process?” At present, there are relatively few tools available that allow policy makers, researchers, and development practitioners to render these power dynamics explicit and thus take steps to mitigate the potentially deleterious effects of power orientations. This is in part due to the sensitive nature of power, its often-subtle manifestations, and complex transformations across actor levels. Consequently the study of power and its impacts on decision-making requires equally subtle and cross-level techniques. This paper seeks to propose one such technique, multi-level stakeholder influence mapping (MSIM), that aims to visibly map and quantify the power or influence of diverse actor groups towards a stated policy. It is argued here that MSIM advances on existing power-elucidating techniques in that its individual interview style mitigates against group polarization (and group think), its use of an elicitation object more easily facilitates the sharing of sensitive information, it allows for power perspectives across multiple actor levels, and it serves as a useful technique in delineating system boundaries as perceived by different actor groups.

Through a case-study format, the proposed MSIM methodology is applied to demonstrate that without proper consideration of the role of power in agricultural climate change adaptation regimes that the resulting interventions will be: insufficient in moderating the negative impacts of climate change, highly contested, less equitable, and ultimately less sustainable. Who makes decisions regarding adaptation responses, the boundary judgments that are made concerning the system, or systems, in question, and the interests, norms, and values of those making decisions will all influence adaptation outcomes. Several authors in the area of critical systems thinking have advanced literature associating these boundary judgments and related concepts with the exercise of power (Churchman 1968; Midgley 2000; Ulrich 1983; van Gigh 2003; Matthews 2008; Flood and Romm 1996; Clegg 1989; Oliga 1996). A critical systems thinking framing of decision making processes in climate change adaptation regimes is thus provided here. Note that while the study uses climate change adaptation to demonstrate the viability of the proposed methodology, MSIM should be of interest to a wider audience of both academics and practitioners alike operating within complex system regimes of any type.

Following this brief introduction, Sect. 2 reviews existing methods for stakeholder power and influence mapping and identifies common methodological shortcomings.

Stakeholder Influence Mapping, the MSIM predecessor methodology is addressed also in this section. Section 3 discusses two central decision making dilemmas relevant to power mapping methodologies, and introduces critical system thinking principles as a way to overcome these barriers. These critical system thinking principles then serve as the basis of Stakeholder Influence Mapping modifications in Sect. 4, and the step-by-step MSIM methodology is introduced. Section 5 discusses MSIM application in the Nepal case study, the results of which are found in Sect. 6. Discussion and conclusion sections then follow.

This paper is theoretical in nature and represents the foundations of a broader doctoral research project examining the role of power relations in shaping adaptation in agricultural systems. As such, the case study in this paper is utilized to advance the methodology outlined herein, and not intended to serve as the basis from policy recommendations regarding Nepal's climate change adaptation regime.

### Stakeholder Influence Mapping

The visual mapping of stakeholders is often associated with the field of “network analysis”. Network analysis has broad application and diverse meaning for management, sociological, and psychological theorists. Predominantly in the area of sociology, Social Network Analysis (SNA) has gained prominence in the past decade (Knoke and Yang 2008). While SNA may be extended to include small groups and organizations (and even states), it is most frequently employed to analyze the relationships between individuals within a social network. Power within SNA is often associated with ‘centrality’, or the quantity of network links or exchanges associated with a given actor or actor group. While SNA does provide some tools for empirical analysis of cross-level dynamics (i.e. systemic action emerging from individual actions) (Coleman 1986), such tools are few in number (Emirbayer 1997).

In a related field, inter-organizational network theorists view networks from a management or institutional perspective. Here authors have sought to demonstrate the type and strength of connections between organizations and institutions in a given strategic network and the conditions under which linkages are established (Mattsson 1984; Paliwoda and Thomson 1986; Oliver 1990). Power is addressed explicitly by inter-organizational network theorists when dependence, conflict or cooperation, mutual expectations, and proximity (i.e. closeness or distance of a relationship) is identified between organizations (Håkansson 1982). Ultimately, multi-level analyses in inter-organizational networks are necessitated by the human composition of organizations and given that relationships and networks are the results of human activities and not the activities of the organization itself (Ritter and Gemünden 2003).

In contrast to these network analyses, MSIM does not speak to the strength or type of connection between the actors discussed, nor does it seek to make any explicit reference to the structure of the network under study. It seeks only to elucidate an actor group's relationship towards a policy process or decision-making scenario, and only by extension, its relationship to other actors. Consequently, MSIM is more closely related to a suite of tools concerned with power dynamics in policy and stakeholder analysis realms. Several ‘traditional’ stakeholder analysis tools that have been widely adopted include: ‘Power Versus Interest Grids’ (Mendelow 1991), ‘Stakeholder Influence Diagrams’ (Bryson 2004), ‘Star Diagrams’ (Eden and Ackermann 1998) ‘Stakeholder Circles’ (Bourne and Walker 2005), and ‘Stakeholder Influence Mapping’ (Mayers and Vermeulen 2005).

Mendelow (1991), and later Eden and Ackerman (1998), have introduced perhaps the most widely adopted influence mapping tool, Power Versus Interest Grids. The two-by-two matrix used in Power Versus Interest Grids compares actor's political interests on one hand, and the stakeholder's power to affect the organization's or issue's future on the other. The stakeholder in question is placed into one of four categories produced by the matrix grid; "Players, who have both an interest and significant power; subjects, who have an interest, but little power; context setters who have power, but little direct interest; and the crowd, which consists of stakeholders with little interest or power".

Power Versus Interest Grids have helped to generate a series of additional tools building off the resulting matrices. Stakeholder influence diagrams, as described in Bryson (2004), for example, indicate how stakeholders on a Power Versus Interest Grid influence one another, using arrowed lines to indicate the direction and magnitude of the influence between stakeholders. The 'bases of power' approach, or star diagrams (Eden and Ackerman 1998), also utilize Power Versus Interest Grids, but explore in greater depth the 'sources' of power and the specific goals and interests the stakeholder aims to achieve.

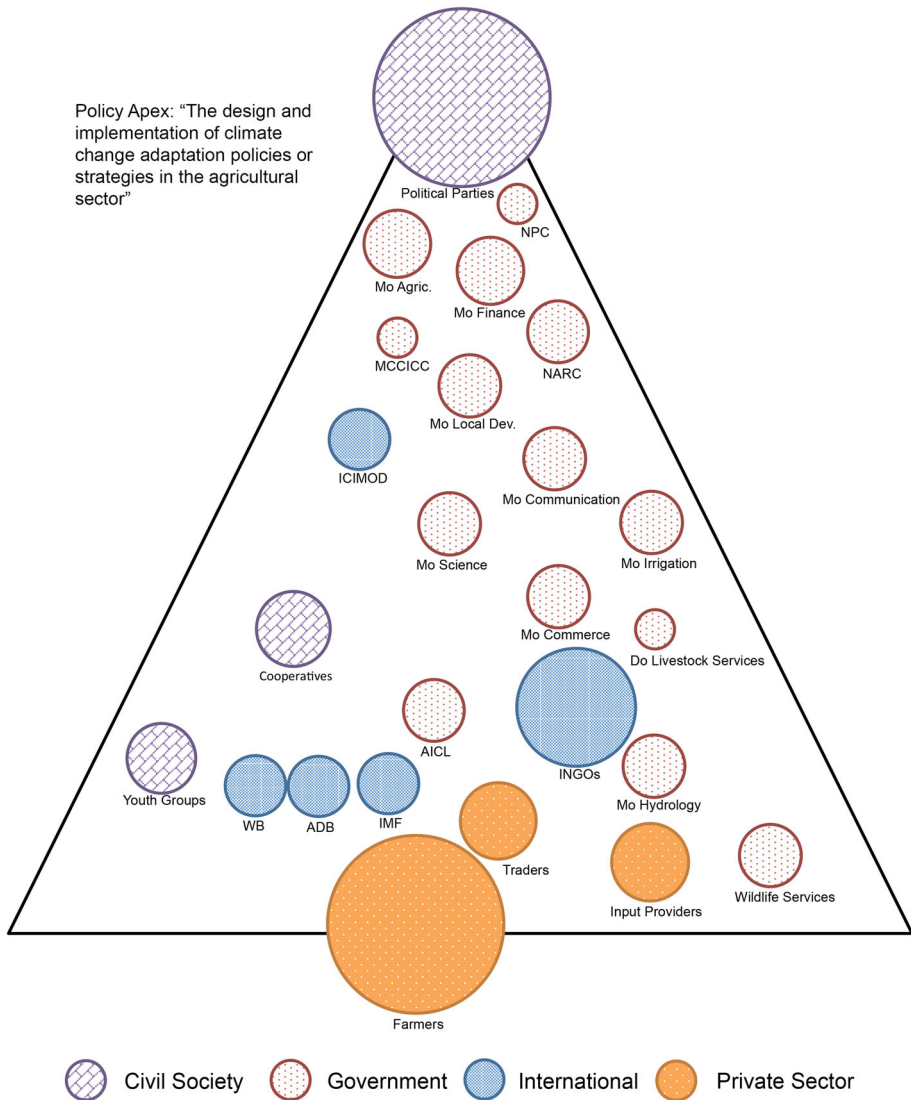
More recently, Bourne and Walker (2005) put forward a "stakeholder circle" methodology for visualizing power and influence as it manifests in project management. The circle displays the distance of relevant stakeholders from the project delivery entity (indicating the potential scope and scale of the influence), the composition of the stakeholder groups exhibiting influence (applying different shades or patterns to reflect homogeneity or heterogeneity or the group), and the relative size/population of the block (the relative area it occupies on the circle), all working to indicate a potential degree of influence that a given stakeholder exerts on the project and project outcomes.

Finally, power mapping has been advanced in the area of socio-ecological systems research through the work of Mayers and Vermeulen (2005), whose "stakeholder influence mapping" tool was been applied in an assessment of Costa Rica's forest policy. The tool uses circles to represent different actor groups and individuals, drawn (or placed, if pre-cut circles are used) by the respondent within a pyramid where the policy/legislation (or broad scenario) in question serves as the pyramid cap or apex. Different color and size circles can be used to represent stakeholder groups (e.g., individuals, government, and civil society). 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. The mapping exercise can be done for different time periods to track relationships in policy evolution over time. An example mapping board is displayed in Fig. 1.

It is Mayer's and Vermeulen's stakeholder influence mapping tool that serves as the basis for a modified influence mapping technique advanced here.

Each of the aforementioned power mapping techniques is intended to be conducted in a focus group or 'planning group' settings. It is argued here, however, that this methodological choice is constricting for two reasons. First, focus group settings can be dominated by actors representing the status quo power regime and, as a consequence, can suffer from intimidation-induced obedience as manifested through the '*hegemony of established norms*'. Secondly, the composition of such focus groups is often dominated by central-level policymakers, a group that represents only one part of the policy process and neglects the inherent multi-level nature of the system.

Given the sensitive nature of power, it is important that an environment is created where respondents feel comfortable sharing their perspectives regarding power dynamics and relationships. Focus groups containing "policy movers and shakers"—the suggested composition of Stakeholder Influence Mapping participant groups (Mayers and Vermeulen



**Fig. 1** Completed stakeholder influence mapping/MSIM mapping board. *Note:* The policy object, or apex, is located at the *top* of the mapping pyramid. In this example map, the respondent was asked to rank actors for their influence regarding the design and implementation of climate change adaptation policies or strategies in the agricultural sector. Actors/actor groups in the form of *circles* that are placed closest to this ‘apex’ are deemed most influential from the perspective of the respondent (political parties, in this example). Actors near the bottom of the pyramid are deemed less influential (but not without influence). The least influential actor group in this example is Farmers. The actor groups have been divided by the analyst into four separate ‘typologies’ indicated by *color* (or *shade*), including civil society, government, international, and private sector actor/actor groups. *WB* World Bank, *ADB* Asian Development Bank, *IMF* International Monetary Fund, *Mo* Ministry of, *Do* Department of, *AICL* Agriculture Inputs Company Ltd, *ICIMOD* International Centre for Integrated Mountain Development, *MCCICC* Multi-sectoral Climate Change Initiatives Coordination Committee, *NPC* National Planning Commission

2005), for example—will often contain representatives with vested interests in the status quo power regime whose authority (or perceived influence) generates obedience among other group members, thereby dictating the influence mapping outcomes. Obedience, according to Matthews, can be defined as a process by which an individual conforms (against their judgment) to the will of an authority figure (2008). Obedience can play out within a concept known as the ‘hegemony of established norms’, or in the social sciences more broadly as ‘normalization’. The hegemony of established norms suggests that even in situations where individuals and group are free to critique the status quo [power regime] the cognitive frames at work within the institution in question cause individuals to independently frame the problem in the same way (Matthews 2008). Power and influence mapping techniques can be conducted individually and collated to mitigate the potentially deceptive effect of normalization.

A second critique can be leveled concerning the typical actor composition of traditional power mapping focus groups. Focusing solely on “policy movers and shakers” often means the recruitment of central level actors, or ‘policy wonks’, typically chosen by the analyst with support from a key informant familiar with the policy context in question. The resulting group composition—reflecting both the analyst’s and key informant’ subjective decisions regarding group membership—can produce a biased understanding of powerful agents and reinforce existing inequalities between actors. Ultimately, political theorists concede that a multi-level approach to policy analysis is needed. This paper adopts a Cash et al. (2006) and Gibson et al. (2000) definition of “scale” as the spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon, and “levels” as the units of analysis that are located at different positions on a scale. Adaptation policy in particular must take into account the multiple scales (jurisdictional, spatial, and institutional, for example) and levels (national, regional, local administrative units, for example) of the policy process (Adger 2001; Adger et al. 2005), commonly considered by the following “stage heuristic”: (1) problem identification, (2) agenda setting, (3) formulation, (4) adoption and (5) evaluation (Sabatier and Jenkins-Smit 1993). Each of these stages implicates different actor sets, knowledge and information, and resources. As MacKinnon (2011) suggests, we must reject the idea that politics occurs on a given, fixed level with defined boundaries. More commonly, actors employ ‘scalar politics’ (referred to as the ‘strategic deployment of scale’) or the purposeful utilization of multi-level structures to promote one’s interests. This dynamic is not easily captured in central level focus groups alone. Power and influence mapping techniques, then, must be able to capture these cross-level characteristics from the perspective of diverse actors that operate in each of the aforementioned policy ‘stages’ (i.e. the “multi-level” in Multi-level Stakeholder Influence Mapping).

A consequence of the ‘normalization’ tendency and inherent central level bias described above is that the resulting power and influence dynamics emerging from traditional mapping techniques are likely to be ‘politically charged’, or biased. Perhaps more importantly, however, is that the analyses are based on the groups’ (sometimes arbitrarily formed) idea about who should be considered relevant ‘stakeholders’ to begin with. These tendencies reflect key differences in “boundary judgments” made by the analyst and group participants alike. It is suggested here that boundary critique, and the associated theory of research and practice, critical systems thinking, can provide a useful lens through which to view these challenges and offer strategies for eluding these traditional pitfalls.

## Boundary Critique and Power

When addressing complex, “wicked problems” (Rittel and Webber 1973) like that of climate change, actors are consistently making decisions regarding 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 (i.e. problem identification), 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 judgments’ in the same situation. Group (or sample) representation, then, can be of severe consequence to the results of decision-making.

Boundary judgments, or where the ‘line’ is drawn between a system of interest and its surrounding environment, are by definition synthetic a priori judgments (Matthews 2008). The idea of critically engaging the normative presuppositions, or a priori knowledge that accompany decision-making can be traced to Kant’s seminal work *The Critique of Pure Reason* (1781). In *Pure Reason*, Kant posits that many of the observed features of objects are explained by reference to traits of the observer rather than traits of the objects themselves. That is to say that ‘objectification’, or the creation of ontological objects, is a human affair rather than simply a natural phenomenon (Matthews 2008). The ‘Copernican Shift’ initiated by Kant and the concept of boundary critique endures today and is captured in the contemporary work of Churchman (1968, 1979), Ulrich (1983) and Midgley (1992), among others, in a theory of research and intervention referred to as critical systems thinking (CST).

Matthews (2008) chronicles the emergence of modern critical systems thinking by reflecting on two ‘dilemmas’ facing planning and decision making: the ontological dilemma and teleological dilemma. The ontological and teleological concepts offer a useful platform on which to introduce critical systems thinking principles and to discuss the importance of rendering explicit the boundary judgments in decision-making around climate change adaptation as explored in the case study.

The distortive effects of boundary judgments during the problem formation stage of decision making is referred to as the ontological dilemma (Matthews 2008). The ontological dilemma centres on the web of interconnectedness within a system of interest and the concept of improvement. That is, something that appears to be an improvement in a system given a narrowly defined boundary may not be seen as an improvement at all if the boundaries are pushed out, revealing additional influencing factors upon the decision problem (Churchman 1968). Moreover, sometimes the implementation of our solution to the problem turns out to have unintended (and deleterious) consequences on another, more important problem that is outside the scope of our study (Churchman 1968, 1971, 1974). This is referred to in systems theory as ‘sub-optimization’ (Hitch 1953). Because no single perspective can exhaust the richness of reality it is impossible to guarantee improvement in complex systems without making boundary judgments that are distortive to the broader context (Matthews 2008) (Box 1).

The teleological dilemma, the second decision-making dilemma, examines the inherently normative bases of decision-making. That is to say that even if we were able to overcome the ontological dilemma and view the system and its influencing factors holistically, ensuring improvement from the perspective of all system agents would still not be guaranteed. Different groups have different needs, interests, and perhaps more fundamentally, different values (Matthews 2008). This, Matthews suggests, introduces a

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**Box 1** Climate change adaptation and the ontological dilemma
 

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Climate change adaptation regimes are affected by the complex interplay of both climate and non-climate factors (Adger 2003), and are thus highly vulnerable to the ontological dilemma. The dilemma manifests, for example, in the temporal considerations of short-term versus long-term adaptation, and the inherently complex relationship between climate change adaptation and development. Sub optimization (i.e. maladaptation) can occur in adaptation regimes when short-term adaptations leave individuals or communities vulnerable to long-term impacts of climate change (Adger and Vincent 2005) either by way of a changing stressor or an unfit ‘solution’. This often manifests in the application of large-scale, technical (hard) adaptations that respond only to short-term circumstances and incentives while neglecting long-term imperatives. Thornton and Manasfi explore this tendency in detail, suggesting “adaptation is a blind, complex, dynamic, and contingent process. While politics emphasizes the short-term view, human adaptation must be judged from a long-term perspective” (2010). Thornton and Comberti discuss, then, the relationship between adaptation and development, in what they refer to as the “mitigation-adaptation disconnect” (2013). They suggest while [development] interventions may increase the potential for incremental adaptation along pathways already realized, commonly realized development interventions often do not support more radical, transformational adaptation [and] may ignore or even undermine other adaptation alternatives or institutions, thus potentially reducing overall adaptive capacity” (2013). Thus, climate change regimes, given the inherent temporal planning challenges and complex interactions with development initiatives, offer prime settings for decision makers to fall victim to the ontological dilemma and resulting sub optimization of adaptation pathways.

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normative component to planning and decision making that is “beyond neutral, uninterested, supposedly value-free, objective, and empirically verifiable management science” (2008). The teleological dilemma suggests that the boundaries around the problem will often be driven by the limited imperatives of a client’s organization as opposed to broader and potentially more important imperatives at of the system as a whole. This bias is referred to as advocacy analysis (Box 2).

Critical systems thinkers, such as Churchman (1968, 1971, 1979), Ulrich (1983, 1987) and Midgley (1992, 2000), understand the challenges posed by both dilemmas and the resulting sub-optimization and advocacy analysis, and suggest that boundary judgements themselves may be a product of power relations (Matthews 2008). Similarly, Midgley et al. discuss the inherently contested nature of these boundary judgments and power plays and discuss the nature of conflict over boundary disputes (1998).

In addressing the ontological dilemma, Churchman argues that the systems ‘person’ (analyst) has a responsibility to “sweep in as much information as possible about the broader system(s) in which the system of interest is situated”. As suggested by Midgley et al., “prior to the work of Churchman many people assumed that the boundaries of a system are ‘given’ by the structure of reality”, when, in fact, they are shaped by personal and social constructs (1998). When it comes to human systems, Churchman argued, pushing out the boundaries of the system and ‘sweeping in’ information means also pushing out the boundaries of who is considered a relevant decision maker (Midgley et al. 1998). ‘Sweeping in’ a wide variety of perspectives (including those that run counter to established norms) is thus an important step in overcoming the ontological dilemma, and an important adaptation of existing power mapping techniques.

The teleological dilemma is addressed most succinctly through the work of Werner Ulrich. Ulrich acknowledges that boundary judgments and value judgments are intimately linked (Midgley et al. 1998). Because we each mobilize different value sets in drawing boundaries, debating boundaries without questioning our own normative presuppositions and ethical stances or that of others can render discussions futile. As such, Ulrich developed a set of twelve ‘questions’ that both planners and ordinary people could use to think through and debate issues. Critical Systems Heuristics (CSH), as it is referred, offers a



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**Box 2** Climate change adaptation and the teleological dilemma
 

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In climate change adaptation regimes, the teleological dilemma manifests through the complex web of actors interested in the adaptation interventions and outcomes, and the multi-level nature of the those interests and perspectives. Given the crosscutting nature of climate change adaptation, it inherently implicates a wide swath of actors. International agencies, state agencies, non-governmental organizations (NGOs), and the private sector (including farmers) each engage in climate change adaptation, and each with their own motivations for doing so. Private sector agents pursuing profit maximization will value market-based adaptation interventions over state-managed direct payments to small-scale producers, for example. Farmers may tend to support just the opposite. Meanwhile, donor agencies may support government interventions that align with their own work plans over activities that support the work package and outcomes of another, competing agency. Ferguson (1990), for example, suggests that governance and development discourse used by certain actors can de-politicize the decision making process, favoring the vested interests of those perpetuating those discourses. This dynamic occurs across actor levels in any adaptation regime. As suggested by Cash et al. “knowledge is often held, stored, and perceived differently at different levels, resulting from differences across levels about what is perceived as salient, credible, and legitimate knowledge, or what is perceived as the important scale or level of the problem, i.e., the plurality challenge” (2006). This complex arena of competing interests and values makes climate change adaptation regimes susceptible to the teleological dilemma and to the underlying impacts of advocacy analysis.

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systemic methodology for handling several key perspective-related issues, and is based on identifying sources of (1) Motivation, (2) Control, (3) Expertise, and (4) Legitimation (1983). CSH addresses both the way that the system *is* and the way that the system *ought to be*, from the perspective of those designing an ‘improvement’ in the system and those affected by it. Acknowledging how sources of motivation, control, expertise, and legitimation, are perceived by ‘designers’ and those affected is an important step in overcoming the teleological dilemma and constitutes a second important adaptation of existing power mapping techniques.

### Multi-level Stakeholder Influence Mapping

The risks of ‘normalization’ (the hegemony of established norms) and central-level biases which plague existing power mapping techniques demonstrate the need for a modified tool which can help to address the resulting ontological and teleological decision-making dilemmas that face system agents. Put differently, to more accurately capture power dynamics a method is required that allows individual perspectives on power to be captured, which represents diverse stakeholders (including designers and those affected), that operates at multiple ‘policy levels’, and that elucidates sources of motivation, control, expertise, and legitimation that underpin both established and dissenting norms. Such a technique is captured in an approach called Multi-level Stakeholder Influence Mapping (MSIM). MSIM is advanced here, building off of the stakeholder influence mapping tool discussed in Sect. 2 (Mayers and Vermeulen 2005).

Adapting the stakeholder influence mapping tool (Mayers and Vermeulen 2005) to meet the aforementioned criteria requires only minor adjustments to the existing methodology. The central methodological design, including the influence pyramid shape with the policy ‘item’ apex, circles representing actor and actor groups, and degree of influence indicated by position relative to the apex remain unchanged. What differs is that MSIM is conducted individually with local (i.e. community), regional (i.e. sub-national), and central level actors (i.e. multi-level actors) as opposed to a focus group of central-level policy ‘movers and shakers’; it offers an additional step for the elucidation of boundary judgements

underlying the mapping results, and it permits the collation of the multiple, individual perspectives into composite maps which reflect power dynamics within the entire ‘system’ or from the perspective of ‘similar’ groups. In MSIM, the completed influence maps serve as the ‘object’ of elicitation questions—a directive approach that uses a picture, video, text, or an object to prompt or elicit discussion (Tracy 2013)—aimed at drawing out the boundary critiques. It has been suggested 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).

Table 1 compares the modified MSIM methodology (right column) with its predecessor Stakeholder Influence Mapping (left column).

The next section applies the MSIM methodology in a case study of Nepal’s agricultural climate change adaptation regime. To develop a counterfactual argument, the mapping results from six central level respondents are combined to produce a single central-level MSIM map that serves as a proxy for traditional stakeholder influence mapping techniques. This serves to reflect what the findings may have been without the application of the multi-level adaptations of the approach.

## Nepal Case Study

Nepal is especially vulnerable to the impacts of climate change, and is among the most vulnerable countries in the world. Observed data across the country indicate a .04–.06 °C annual rise in maximum temperatures, a warming rate higher than the global average (Government of Nepal 2010). The country’s agricultural sector, dominated by its southwest districts in the Terai plains bordering India, is inextricably linked to climatic trends, relying on monsoon rainfall and high mountain snow melt to source water for a system dominated by rain fed agriculture. The central government of Nepal, together with the country’s development partners, have identified the need to adapt the country’s agricultural systems to a changing climate. This priority has been met with the establishment of a Climate Change Policy (2011), National Adaptation Programme of Action (Government of Nepal 2010), and a scheme for the development of localized adaptation plans, Local Adaptation Plans of Action (2011). This policy environment has been matched by the creation of new institutional structures including a 25-member Climate Change Council (CCC) and Multi-stakeholder Climate Change Initiatives Coordination Committee (MCCICC), plus the implementation of donor-funded programs like the Pilot Program for Climate Resilience (PPCR) and the Poverty-Environment Initiative (PEI), to mention only a few.

The plurality of actors engaged in Nepal’s adaptation regime reflects the influx of available funding for agencies operating in the area of climate change in the country. The funding surge, together with ongoing political instability have combined to create a power vacuum with regard to decision making and agenda setting within the country’s adaptation regime. This has brought into question the ownership that Nepali citizens have over their own adaptation decisions, and has ignited debates about whether adaptation needs at the community level are being appropriately met (Dulal et al. 2010). Nepal’s adaptation regime, then, offers a fruitful testing ground for the application of the MSIM methodology.

## Methodology

This section provides details around the application of the MSIM methodology in Nepal through the data collection phase. Data analysis will be covered in the next section.

**Table 1** Comparing the Stakeholder influence mapping with MSIM

Stakeholder Influence Mapping (Mayers and Vermeulen 2005)	Multi-level Stakeholder Influence Mapping (MSIM)
1. Define policy focus	<p>1. Define policy focus. Influence mapping is applicable to almost any decision-making ('policy') scenario. As MSIM aims to draw power relations across different actor levels, the "policy focus" may need to be adjusted for different respondent groups. That is, given the diverse stages of the policy development process we will need to use different language and devices to capture different manifestations of the same policy process. In this case study (Sect. 5), 'agricultural climate change adaptation policy' (central level) is 'translated as 'the design and implementation of climate change adaptation initiatives or strategies in agriculture' at the regional level, and "the ability to produce food, earn income, or subsist when the weather changes' at the local level</p> <p>Who: analyst Time required: n/a</p>
2. Define one or more key time periods	<p>2. Define one or more key time periods. The methodology put forth here acknowledges the limited time availability of potential respondents, particularly at the central decision making level. As such, it is recommended that the 'actual' or 'current' power/influence regime be captured during the mapping exercise. Information regarding the historical evolution of the regime and emerging trends can be captured in "key moments and mechanisms" (Step 10) and "assessing system boundaries" (Step 11). For more normative analyses, respondents can be asked to rank how they <i>anticipate</i> power dynamics will look into the future (e.g. 2025 or 2050). Similarly, respondents could be requested to rank actors according to how they feel actors 'ought to be' positioned in terms of power. Both of these approaches offer more subjective, value-based perceptions of actor groups, and can be accommodated by the MSIM methodological framework</p> <p>Who: analyst Time required: n/a</p>
–	<p>3. Identify influence-mapping respondents. A sampling strategy will need to be applied to select MSIM respondents at various actor levels. In the case of climate change adaptation, it is possible to capture responses from the entire relevant population at the central level (given the small number of central level institutions and actors currently engaged in climate change adaptation policy). A strategy is needed for lower administrative units (i.e. determining which districts/villages will be sampled). Again in the case of climate change adaptation, districts could be chosen on the basis of vulnerability to environment change, for example, should that information be available in the study country. Standard sampling techniques (i.e. simple random, systematic, or rational subgrouping) could also be applied here</p> <p>Who: analyst with support from key informants Time required: 1 week, but will vary depending on sampling strategy</p>
3. Identify policy stakeholders	<p>4. Identify policy stakeholders. A comprehensive stakeholder list should be created by conducting a institutional/stakeholder analysis prior to beginning MSIM interviews. This actor list should be created in spreadsheet format to facilitate printing and ease of use in an interview setting. It should provide a means by which the stakeholders can be easily marked by the respondent as "highly relevant" as required in step 6 (i.e. a tic box space)</p> <p>Who: analyst with support from key informants Time required: 1 week</p>

**Table 1** continued

Stakeholder Influence Mapping (Mayers and Vermeulen 2005)	Multi-level Stakeholder Influence Mapping (MSIM)
4. Prepare materials	<p>5. Prepare materials. For each interview the practitioner will need (1) a printed version of the comprehensive actor list, (2) printed MSIM mapping board (A4 size), (3) pen/pencil and (4) recording device (audio or paper)</p> <p>Who: analyst</p> <p>Time required: 1 day</p>
5. Fine-tune the stakeholder list	<p>6. Fine-tune the stakeholder list. Present the respondent with the comprehensive actor list. Ask the respondent to place a checkmark ('tic') next to the actors that they feel are 'highly relevant' to the policy focus in question. The respondent is free to add new actors to the list, or suggest that others be removed if they feel strongly. In this case study example, there was no limit placed on the number of actors the respondent could 'tic' as relevant, however, the practitioner may choose to set an upper/lower limit (i.e. 20 actors, for example). The rationale for an initial prioritization of actors/actor groups is to bring the stakeholder list down to a more manageable size, given time constraints (i.e. it would not be practical, nor possible, to rank all 90 actors on the mapping board)</p> <p>Who: respondent</p> <p>Time required: 20 min (for each interview)</p>
6. Estimate stakeholder group size	<p>7. Estimate stakeholder group sizes. As suggested in the Stakeholder Influence Mapping methodology "Different sized stakeholder groups can be represented by different sized paper circles representing the number of people in the group (smallest = fewest, biggest = most)". As the circles will be drawn (in pen/pencil) on to the A4 mapping board in the MSIM methodology, the respondent should simply be reminded of to reflect this size/population factor in the drawing of circles. Ultimately, the circle size has no bearing on the calculation of an influence score, and is simply an aesthetic consideration to improve the legibility of map. The size of the circle is decided at the discretion of the analyst/respondent</p> <p>Who: analyst, respondent and/or key informant</p> <p>Time required: n/a</p>
–	<p>8. 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 used here is "Power is the ability to influence the behaviour of others, with or without resistance". Or power could be defined to the respondent by referring to common power "bases" (i.e. Positional, Personality, Persuasion, Coercion, Force, Knowledge, Resources). It may also be worth distinguishing between power and influence (i.e. influence as the ability to exercise a particular type(s) of power). The practitioner could also inquire as to the respondents definition of power/influence</p> <p>Who: analyst</p> <p>Time required: 5–10 min (for each interview)</p>

**Table 1** continued

Stakeholder Influence Mapping (Mayers and Vermeulen 2005)	Multi-level Stakeholder Influence Mapping (MSIM)
7. Map stakeholder influence and relationships	<p>9. Map stakeholder influence and relationships. Introduce the power-mapping board. State that the exercise you are going to do is designed to visualize the power and influence of actors as it relates to a certain policy or topic. Starting from our list of ticked, ‘highly relevant’ actors, circles will be drawn on the mapping board with the most influential actor/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 objective is to define how things actually are, not the way that they are intended or ‘ought’ to be (unless normative analyses are being conducted as discussed in Step 2). Additional actors that come to mind that were not initially indicated in Step 6 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 mapping concept</p> <p>Who: respondent Time required: 30 min (for each interview)</p>
8. Identify key moments and mechanisms	<p>10. Identify key moments and mechanisms. As each actor is placed on the map, ask (as used in this case study): (1) What type of power/influence is this actor/actor group exercising? (i.e. Positional, Party association, Personality (charisma), Persuasion, Coercion, Force, Knowledge, Resources); (2) What gives this actor/actor group the right to exercise power? (This is aimed at drawing out policy/legal frameworks); (3) 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? 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)?</p> <p>Who: respondent Time required: n/a, conducted simultaneously with Step 9</p>
–	<p>11. Assessing system boundaries. After the exercise has been completed, reflect on the map that has been produced. Ask the respondent critical system heuristics questions (Ulrich 1983) regarding control, motivation, knowledge, and legitimacy. This is an important step aimed at drawing out the way the system ‘ought to be’ (a key systems thinking concept) versus the actual state of affairs. Questions may include the following: Motivation—why would you want to be planning/intervening in this system in the first place? Control—who should have decision-making power? What should people have some say over, and what shouldn’t they have a say over? Knowledge and expertise—what forms of knowledge are necessary and from what sources? 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? In addition to those suggested above, example CSH questions may include: [Asking 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?; Where do these actors go for knowledge and expertise? Where would you go?; Who else should have a say? By what means/channels do they have a say?</p> <p>Who: respondent Time required: 15 min (for each interview)</p>

**Table 1** continued

Stakeholder Influence Mapping (Mayers and Vermeulen 2005)	Multi-level Stakeholder Influence Mapping (MSIM)
9. Keep record of map for future reference	12. Keep record of map for future reference. Digitize to facilitate analysis Who: analyst Time required: 1 day (for digitizing 30 maps)
–	13. Calculate Influence Score. Determining an influence score from multiple, individual maps involves two principle variables: (1) frequency, or the percentage of respondents that find the stakeholder group ‘highly relevant’ to the policy focus in question; and (2) relative (or adjusted) ranking, or the average ranking level at which the stakeholder is placed on the map by respondents (the higher the ranking level, the higher the perceived influence). These two variables can be combined in several combinations to produce an composite influence score (See Sect. 5b for details) Who: analyst Time required: 2 days (for analyzing 30 maps)

The ‘steps’ listed in here refer to the right column of Table 1 and are not necessarily in sequential order. Material preparation steps are not included here.

The policy focus (Step 1) chosen for the Nepal pilot was “agricultural climate change adaptation policy”, and respondents were asked to consider only the current state of power dynamics (i.e. 2012) with regard to that policy focus (Step 2). A total of 14 separate respondents participated in the MSIM pilot, chosen for the diversity of actor group types that they represented (i.e. Government, NGO etc.). This included six national-level respondents, six district-level respondents, and two local village-level respondents (Step 3). Local-level components of this research were conducted in Nepal’s Rupandehi District, Makrahar Village Development Committee (VDC), located in south central Nepal. District-level data collection occurred in the municipality of Bairahawa, Rupandehi’s designated District Development Committee (DDC); while central-level data collection occurred in Nepal’s capital city, Kathmandu. Interviews, conducted individually, lasted on average 1.5 h. Data were collected between May and September 2012.

Each participant in the influence-mapping exercise was first asked to study the detailed stakeholder list and indicate by ‘tic’ or check mark actors (individuals or organizations) ‘highly relevant’ to the policy apex “agricultural climate change adaptation policy” (Step 6). The stakeholder list used in Nepal’s MSIM pilot contained approximately 90 actor groups, organized (and randomized within) the following groupings: public sector, private sector, NGOs and civil society, bi/multilateral donors, and Community Based Organizations (CBOs) (Step 4). Respondents were encouraged to write-in any actors/actor groups they perceived to be absent from the list. Table 2 shows the actors/actor groups most frequently identified as “highly relevant” to Nepal’s climate change adaptation regime (in % of respondents) by the entire sample of 14 respondents.

The respondents then visually ranked each of the actors deemed “highly relevant” one-by-one on the influence mapping board, drawing—in the form of a circle—the ‘most influential’ actor/actor at the top, or apex of the pyramid, and the least influential at the bottom (Step 9). Power was defined to the respondent as “the ability to influence the behavior of others, with or without resistance, utilizing any of the listed power “bases” (i.e. position, personality, persuasion, coercion, force, knowledge, resources) (Step 8).

**Table 2** Actors/actor groups most frequently identified as ‘highly relevant’ to Nepal’s agricultural climate change adaptation regime 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 (NPC)	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

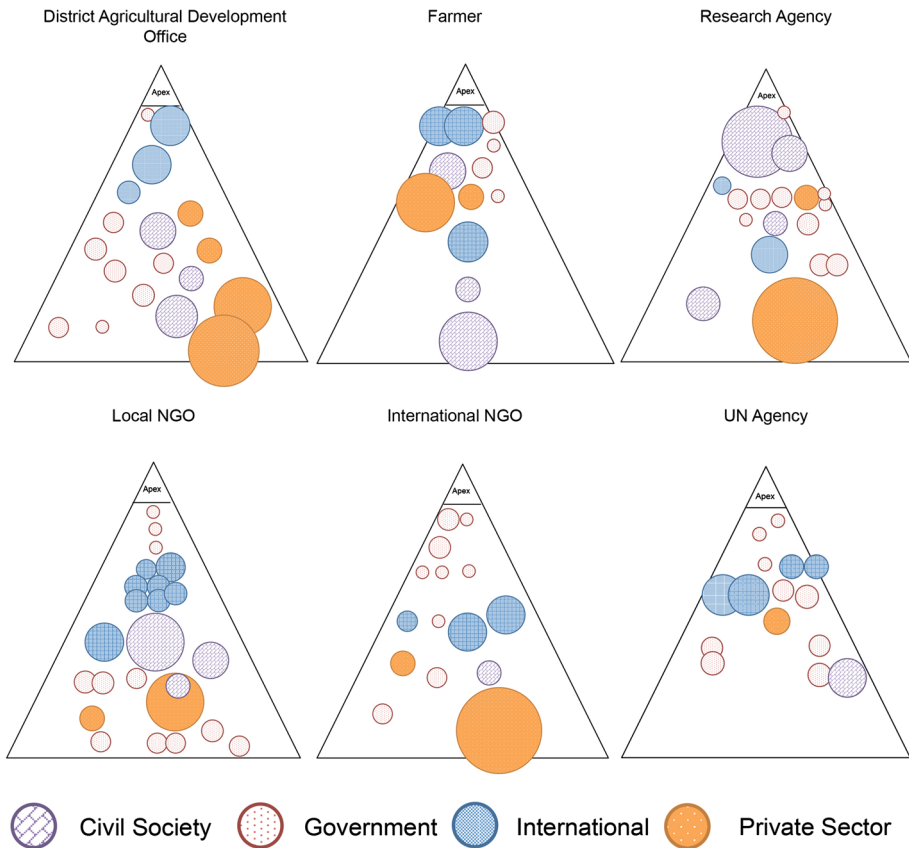
As each actor was placed on the map, key moments and mechanisms (Step 10) that contribute to power dynamics were identified and were recorded on paper (or audio recorder). The institutions identified in this process (e.g. fertilizer subsidy, Local Self-Governance Act, and Climate Change Policy, for example) were later studied systematically, serving as the basis of comprehensive policy review of Nepal’s adaptation regime (Sova and Chaudhury 2013). After the mapping was completed, responses related to the assessment of system boundaries (Step 11) (i.e. motivation, control, expertise, and legitimation) were also recorded, providing insight into the sorts of information deemed legitimate by different actor groups, perceived motivation for the behavior of certain actor groups, and the identification of various informal means of political engagement (striking, crony relations etc.). This is explored in detail in results Sect. 6.

The paper mapping boards were then digitized (without modification of the actor circle locations) (Step 12). The four distinct colors (or shades) were used to represent actor/actor group categories including state agencies (red), civil society (purple), 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 below in Fig. 2.

### Calculating Influence

The calculation of an influence score (Step 13) marks a key divergence from the original Stakeholder Influence Mapping tool. The scoring process is necessary in MSIM, however, as it allows for the individual maps to be combined to produce a single (or multiple) composite map(s).

To create an influence score derived from multiple interviews, the frequency that actors were deemed “highly relevant” by respondents was combined with their relative ranked position compared to other actors on each map. 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



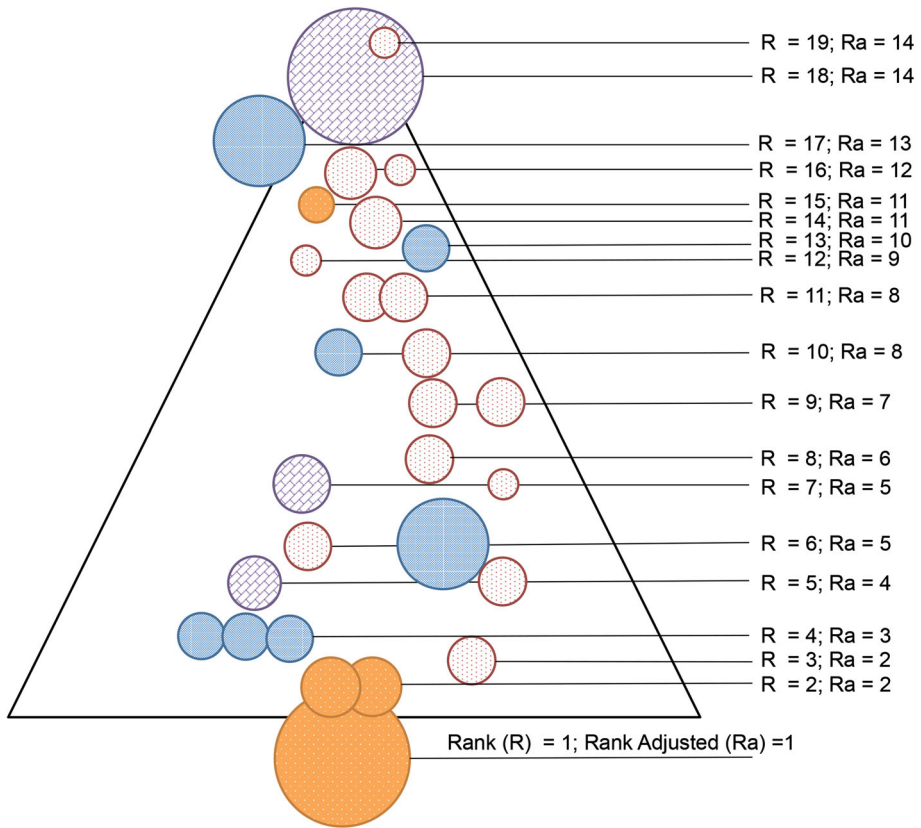
**Fig. 2** Example MSIM maps produced by pilot group respondents. *Note:* In this select group of maps (6 of the 14 total maps), the names of actor groups have been removed, simply for legibility given the small size of the figure. Specific respondent and organization names have also been removed

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 (See Fig. 3). 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 “highly relevant” in Step 6 a different number of ranking levels could feasibly be identified by each respondent. As such, the number of ranked levels was identified for the entire sample yielding an average of 14 ranked actor levels. The relative ranking (‘R’ above) for each stakeholder on each respondent map was then adjusted to this 14-level 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 ‘relative’ and ‘adjusted’ ranking scores are then recorded in a spreadsheet as demonstrated in Fig. 4. The left column of the spreadsheet contains the entire list of actors/actor group the respondent was first asked to ‘tic’ as highly relevant. In this case, the first column of the table would contained approximately 90 actors. The top row of the spreadsheet, then, contains the respondent information and the cumulative statistics regarding ‘frequency ranked’, ‘average adjusted ranking’, and an ‘influence score’.





**Fig. 3** Depiction of relative and adjusted ranking scores for ‘respondent A’. *Note:* Adjusting the ranking scores will be necessary in MSIM analyses given that respondents will likely place actor *group circles* on a *different number* of ranked levels. In this example, the respondent (respondent A) ranked actors groups on 19 separate levels. Another respondent (respondent B) may place actors on only 12 levels. If left unadjusted, the actor placed at the top of the mapping board by respondent A will have a score of 19, when the equivalent ranking by respondent B will score only 12. This must be adjusted so that the highest ranked actor groups on each map receive the same score. In the Nepal pilot the average number of levels ranked across all the respondents ( $n = 14$ ) was 14. The scores for respondent A are adjusted in this figure to that 14 level equivalent

Combining the adjusted ranking score of each actor group with the frequency that the group was identified as “relevant” by the respondent (i.e. the frequency that it was ranked) is the final step in identifying a composite influence score. There are several approaches that the analyst could choose in producing this 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 a preferred variable.

The approach to producing a ranking score suggested in this example combines both ranking and frequency metrics into one composite score in such a way that reduces the impact of outliers in ‘frequency’ or ‘average adjusted ranking’ (i.e. imagine a case where a stakeholder group is identified as ‘relevant’ by only two of the 14 respondents in the sample. Yet when that stakeholder is placed on the mapping board, on both occasions it is ranked at the highest possible ranking level (i.e. 14). It could be argued that an equal

a.                    b.                    c.

**Ranking Scores (Relative and Adjusted) by Respondent**

Actor/Actor Groups	Respondent #1	ADJUSTED (14)	Respondent #2	ADJUSTED (14)	Respondent #3	ADJUSTED (14)	Respondent #4	ADJUSTED (14)	ETC...	Frequency Ranked (Sample Size 14)	Average Adjusted Ranking (Maximum 14)	Influence Score (Cumulative Adjusted Ranking / Sample Size)
	Ministry of Agriculture Development (MoAD)	9	10	12	14	17	13	—	—	-->	11	10.0
INGOs (World Vision, IDE, CARE, WWF, Practical Action, Oxfam, Action Aid etc)			8	10	7	5	4	6	-->	11	8.7	6.8
Village Development Committee (VDC)	3	3	—	—			9	13	-->	11	5.4	4.3
District Development Committee (DDC)	3	3	—	—					-->	10	5.5	3.9
Ministry of Environment (MoE)	7	8	—	—	16	12			-->	9	11.5	7.4
Traders	8	9	5	6	3	2	8	11	-->	9	7.0	4.5
Agricultural Cooperatives	6	7	4	5	8	6	1	1	-->	9	4.6	3.0
National Planning Commission (NPC)	5	5	12	14	18	14			-->	8	12.0	6.9
Political Parties (NC, CPN-UML, UCPN-Maoist, CPN-Maoist, Madhesi Front etc)	11	12	—	—	19	14	6	9	-->	8	8.0	4.5
ETC...	↓	↓	↓	↓	↓	↓	↓	↓				
# OF RANKING LEVELS (Average = 14)	13	14	12	14	19	14	10	14				

**Fig. 4** Example spreadsheet segment for recording MSIM ranking scores

weighting of ‘frequency’ and ‘adjusted ranking’ in this case would produce an outcome that overestimates the relative influence of the stakeholder group in question given the low frequency at which this group is identified as ‘relevant’).

In the approach applied here, the adjusted rankings for each actor/actor group are summed and then divided by the maximum frequency score of 14 (i.e. supposing 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. has a mean adjusted ranking of zero).

$$I = \Sigma Ra(n1 - n14)/14,$$

where ‘I’ represents the composite influence score, ‘Ra’ the adjusted ranking, ‘n’ the respondent number, and 14 the maximum frequency score.

**Results**

The results from the production of influence scores are presented in this section for central level respondents, the entire sample (most/least influential), local level respondents, and compared central and local level responses for the identification of ‘bridging agents’.

Central Level Respondents

To serve as a proxy for traditional Stakeholder Influence Mapping results, the individual maps from six central level respondents have been combined to produce the following list of perceived most highly influential actors (Table 3). This respondent sample contains the type of “movers and shakers” that compose typical policy focus groups in power analyses. This includes, for example, a member of the Climate Change Council, United Nations Development Programme, an International NGO, the Global Environment Facility, and two national media representatives.

The central level mapping results suggest the Ministry of Environment to be the most influential agency with regard to agricultural climate change adaptation in Nepal. The Ministry of Environment is followed closely by the Climate Change Council and the Ministry of Agricultural Development (MoAD) in terms of influence. After these state agencies is a ‘who’s who’ of donor and development groups, including the UK Department for International Development (DFID), the Asian Development Bank (ADB) and the World Bank, among others.

Justification for the placement of these actors as ‘highly influential’ commonly included “access to international climate change funds”, “access to international policy expertise”, and “explicit mandate relating to climate change”. Specifically, perceived motivation for action in the realm of climate change for these actors was based largely on opportunity (i.e. increased funding availability). The policy and legislative mandates of the state agencies on this list constitutes the perceived form of control, while access to and control over funding channels constitute sources of control for the donor and funding agencies. Perceptions of relevant expertise are generated, according to respondents, through the closeness of these agencies to international research in best practices in the area of climate change adaptation, and monopolized access to climate data. Finally, the perceived legitimacy of these actors is achieved through institutional authority of the state agencies and ‘brand-recognition’ of the funding and development groups cited here. That is to say that the image of access to higher “levels” and diverse sources of funding and expertise resulted in higher “influence ranking” for these actors.

Unsurprisingly, the actors and actor-groups identified as highly influential by central level respondents reflect the agencies primarily responsible for policy *design and funding*. Structures of local governance, community-based organizations, traditional authorities—or in other words, those responsible for interpretation and implementation of, and those affected by central level policies, such as subsistence farming communities—are notably absent from this list of influential actors.

### Combined and Local Level Respondents

To emphasize the limited scope of power analyses produced by central level respondents alone, Table 4 demonstrates what happens to the power/influence outlook when additional perspectives are ‘swept in’ from across several levels of Nepal’s adaptation regime. This respondent group includes both policy ‘designers’ and those affected at the district and community levels.

Immediately striking is the inclusion as ‘influential actors’ several group-types absent from the central-level respondent list; most notably the Indian Government, political parties, private sector actors in the form of traders (market agents), and several local-level institutions including the Village and District Development Committees, and the Ministry of Local Development. For a more detailed understanding of the drivers behind this combined, full sample list, we can extract and analyse only local level actor responses (Table 5). Local level respondents include a representative from the Village Development Committee, community members (farmers), agricultural input providers, local NGOs, and agriculture and livestock service centre representatives. As the local level list contains a more diverse set of actor ‘types’, CSH sources of motivation, control, expertise, and legitimacy in this section are discussed in a less holistic, and more actor-specific manner.

At the local level, traders top the list of perceived highly influential actors with regard to agricultural climate change policy. This is the case because at the community level, MSIM respondents associate policy success with market opportunity. Market opportunity, then, is controlled and invested metaphorically (and quite literally) in those agents that purchase and market the agricultural surplus provided by farmers operating at this level.

**Table 3** Most influential actor/actor groups in Nepal's agricultural climate change adaptation regime (central level respondents, n = 6)

Actor/actor group	Average adjusted ranking	Influence score
Ministry of Environment (MoE)	11.7	11.7
Climate Change Council (CCC)	12.5	10.5
Ministry of Agriculture Development (MoAD)	9.0	9.0
DfID	11.4	7.6
ADB	12.7	6.3
World Bank	12.7	6.3
USAID	11.7	5.8
National Planning Commission (NPC)	11.4	5.7
GtZ	10.9	5.5
Norwegian Government (NorAD)	10.9	5.5
INGOs (World Vision, IDE, CARE, WWF, Practical Action, Oxfam, Action Aid etc.)	8.0	5.3
Multi-Stakeholder climate change initial coordination committee (MCCICC)	10.5	5.3

Traders are followed closely by International NGOs in terms of influence at this respondent level. INGOs are deemed highly influential because of their delivery of development services to rural communities in the absence of such service provision by the state. Their motivation for engaging in climate change adaptation initiatives is thought to be genuinely development-oriented (unlike central level actors who are perceived to be responding only to funding opportunities). It is also perceived that INGOs possess expertise superior to that of local state agencies.

The Indian Government's inclusion among the most influential agents at the community level is a reflection of local geopolitical factors. The local level respondents are situated in the southernmost limits of Nepal's Rupandehi district along the border of India. They cite the dumping of cheap agricultural produce from India in Nepali markets as the prime factor for the Indian Government's influential position. Indian subsidies on agricultural inputs for its producers are a central tenant of Indian agricultural policy. Perceived control over the impact of agricultural adaptation policies, then, is seen here not as derivative of decisions made in Kathmandu, but of those made in New Delhi. Consequently a system framing by central level decision makers that recognizes the environment within Nepal's international borders as the only realm of influencing factors would be insufficient arriving at solutions that suit the needs of these local level respondents; a classic case of sub-optimization.

Political parties are also present on the list of highly influential actors at this level. This reflects micro-political dimensions at work that contrast with perceptions at the central level. Nepal's Constituent Assembly (CA), a transitional Parliamentary body, was dissolved in May 2012 following a failed attempt to ratify a new constitution in Nepal. While this impacted the perceived influence of political figures (and damaged confidence in the political process) operating at the central level, local level respondents continue to cite the influence of political parties at the grass roots level. They cite, for example, political alignment as a key factor in success for securing funds for projects the Village Development Committee (VDC), the lowest unit of state administrative unit in Nepal.

Finally, we also see on this list the inclusion of community leaders as highly influential actors with respect to agricultural climate change adaption policy. Traditional leaders make the list of highly influential actors at this level because traditional ruling structures have not been ‘replaced’ by modern democratic institutions to the extent that they have at the central level. Community leaders at this level derive their influence from possession of local knowledge and expertise, legitimized through ethnic tradition.

Ultimately, the actors deemed highly influential at this level are, by and large, the agencies that *implement* policy at the district and community levels in Nepal. The agencies that sources funding and develop climate change policies (mainly MoE) are not included in this local level list.

### Bridging Agents

Power is often maintained through networks of actors, reinforced through the formation of alliances between actors wielding various competing or complementary resource bases. The volatility (and strength) of these networks is dictated by several innate characteristics of complex, multi-level/scale systems. MSIM can play an important role in elucidating potential boundary or bridging agents (Guston 2001) who play intermediary roles in brokering relations in the co-production of knowledge. Consider, for example, actor/actor groups that are identified as “highly relevant” and highly influential by respondents that operate at different actor levels within Nepal’s climate change adaptation regime. Table 6 shows the top twelve most influential actors as perceived by both central and local level respondents.

There are three actors that are common between both ranking levels: the Ministry of Agriculture Development (MoAD), the National Planning Commission, and INGOs. These three actor groups, because of their perceived influence, carry the potential to translate actions across actor levels. MoAD in particular has a widespread network of district agricultural development offices and agricultural service centers. INGOs, as referenced by local level actors, provide service delivery in the absence of state-led provision. INGOs in Nepal, however, operate with relative autonomy from the state, so their agendas are not always in line with that of the National Planning Commission or MoAD, for example. MSIM can assist in surfacing these key bridging actors and power-dynamics in simple, straightforward manner.

### Least Influential Actors

Finally, before discussing the implications of the above power dynamics it is worth exploring those actors/actor groups that are deemed least influential by respondents. Table 7 identifies the actors with the lowest influence scores among those actors/actor groups identified as “highly relevant” by six or more respondents.

Table 7 shows that ‘farmers’ are the least influential of the “highly relevant” stakeholders in the agricultural climate change adaptation policy development and implementation process. Farmers were identified by 8 of the 14 respondents as highly relevant, and received an average adjusted ranking of 1.9 (out of the maximum 14), which combined with this frequency produces an influence score of 1.1, the lowest of all highly relevant actor groups. The fact that ‘farmers’ were identified as ‘highly relevant’ to agricultural adaptation by only half of respondents is, in itself, descriptive as to where the perceived boundaries of adaptation responses lie. Nepal’s Agricultural Inputs Company, responsible for subsidized fertilizer distribution in the country, received an influence score of 2.7 followed by input providers (2.7), and agricultural cooperatives (3.0).

**Table 4** Most influential actor/actor groups in Nepal's agricultural climate change adaptation regime (entire sample, n = 14)

Actor/actor group	Average adjusted ranking	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

**Table 5** Most influential actor/actor groups in Nepal's agricultural climate change adaptation regime (local level respondents, n = 5)

Actor/actor group	Average adjusted ranking	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
Indian Government	7	5.6
Political parties (NC, CPN-UML, UCPN-Maoist, CPN-Maoist, Madhesi Front, and so on)	6	5
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

## Discussion

The above analysis demonstrates that perceptions of power (and the resulting boundary judgments) made by central level actors alone in Nepal can miss out on the role of private sector and local actors (most notably 'traders') in converting agricultural climate change policy into market opportunities, the impact of localized geopolitics, the important role of co-governance structures vested in community leaders, and the persistence of micro-

**Table 6** Bridging agents (in bold) between central and local/district actor levels

Most influential actors (central level)	Most influential actors (local/district level)
Ministry of Environment (MoE)	Traders
Climate Change Council (CCC)	<b>INGOs (World Vision, IDE, CARE, WWF, Practical Action, Oxfam, Action Aid etc.)</b>
Ministry of Agriculture Development (MoAD)	Village Development Committee (VDC)
DfID	Local NGOs
ADB	Indian Government
World Bank	Political parties (NC, CPN-UML, UCPN-Maoist, CPN-Maoist, Madhesi Front, and so on)
USAID	<b>Ministry of Agriculture Development (MoAD)</b>
National Planning Commission (NPC)	Community leaders
GtZ	District Agricultural Development Office (DADO)
Norwegian Government (NorAD)	Agricultural Service Center
INGOs (World Vision, IDE, CARE, WWF, Practical Action, Oxfam, Action Aid etc.)	Department of Livestock Services (DoLS)
Multi-Stakeholder climate change initial coordination committee (MCCICC)	<b>National Planning Commission (NPC)</b>

**Table 7** Least influential actor/actor groups in Nepal's agricultural climate change adaptation regime (entire sample, n = 14)

Actor group	Frequency	Average adjusted ranking	Influence score
Farmers	8	1.9	1.1
Agricultural Inputs Company Ltd (AICL)	7	5.4	2.7
Input Providers	6	6.3	2.7
Agricultural cooperatives	9	4.6	3
Community leaders	6	7.7	3.3
Local NGOs	8	6	3.4
Ministry of Irrigation (MoIR)	6	8	3.4
District Development Committee (DDC)	10	5.5	3.9
Ministry of Local Development (MLD)	6	9.4	4
Nepal Agricultural Research Council (NARC)	6	9.7	4.2
Village Development Committee (VDC)	11	5.4	4.3

politics that occur at the local level. As a consequence, policy interventions identified by central level actors alone are highly susceptible to the risks of sub-optimization when translated into on-ground actions at the local level. Similarly, decision makers at this level risk advocacy analysis stemming from the teleological dilemma as a result of the strong influence of international organizations that can circumvent state-led process to impose their own mandate and framing of adaptation policy. If power mapping users were to base their lobbying and resource allocation efforts on results from central level focus groups alone, there would be a marked tendency to frame adaptation policy challenges in terms of planning and funding, neglecting framings around policy implementation and impact.

Conversely, boundary judgments and perceptions of power made by local level actors can fail to recognize critical funding and central-level planning agents. When local level priorities do not align with the macro conditions set by these agents there is a risk of sub-optimization, particularly if site and context specific actions are arbitrarily ‘scaled-up’ and applied in different places with different influencing factors. Advocacy analysis and the teleological dilemma also plague local level agents and the resulting adaptive responses. This is due principally to the pervasiveness of local micro-politics and the localized geopolitics from India that drive local level agendas.

MSIM provides the analyst with both central and local level power perspectives—a unique vantage point for the identification of critical disconnects between system actors. Extending the analysis across actor levels allows the analyst to identify bridging actors between institutional levels, and by interrogating sources of control, motivation, expertise and legitimacy explore how power ‘moves’ through different actor levels. Additionally, the 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 adaptation or policy processes, but do not leverage influence in any meaningful way. Respondents could also be grouped by their ‘actor-type’ (e.g. state agencies, INGOs, private sector) to produce composite influence maps from the perspective of those like-minded groups.

## Limitations

There are several key methodological limitations worth discussing. First, MSIM provides the analyst with perceptions-based data regarding the relative power and influence of actors in the study regime. Perceptions are inherently normative and subject to bias. As such, they do not necessarily speak to actual influence or capability of actor groups to 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. It is also recommended that MSIM be used in concert with other complementary methods. Empirical evidence like budget allocations, results of decision-making processes (e.g., resulting policy objectives or priorities), participation in decision-making forums and so on can be used alongside MSIM maps to confirm or further clarify the sources or manifestations of power/influence.

Second, MSIM 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. This can be remedied to a certain extent through a clear discussion and shared understanding of what is meant by ‘power’ and ‘influence’ before mapping begins.

Finally, as discussed in Sect. 2 above, MSIM does not directly address the strength or type of connection between the actors ranked or the structure of the network under study. MSIM focuses primarily on the individual significance or influence of a group, rather than the relationships between groups. Relational information is captured to a certain extent in Step 10 “Identify key moments and mechanisms” and Step 11 “Assessing system boundaries”, but could benefit from integration with SNA and IOR network analysis tools, an area for potential future research.



## Conclusion

There are relatively few tools or methodologies allow analysts and decision makers to render explicit the power and relational dynamics present within a multi-scale, multi-level system of interest. Those that do exist collect perspectives regarding power dynamics in a focus group or decision group setting, making them susceptible to distortion due to obedience and intimidation from status-quo defenders and group composition biased towards central level actors. These characteristics of influence mapping techniques exacerbate two central dilemmas in decision-making; the ontological dilemma and the teleological dilemma. The ontological dilemma suggests that distortive boundary judgments in the problem formation stages of decision making can lead to the neglect of key factors influencing the system and ultimately lead to sub-optimization. The teleological dilemma refers to the normative bases of decision-making and recognizes that the different needs, interests and values of groups shape courses of action and definitions of system improvement, risking advocacy analysis. Both dilemmas center on the concept of boundary critique. The decision making dilemmas can be assuaged to a certain extent by ‘sweeping in’ as many perspectives as possible regarding the broader system and by engaging both system designers and those impacted regarding their perceptions of sources of motivation, control, expertise and legitimacy by actors within the system. The Stakeholder Influence Mapping methodology can be adapted to incorporate these principles.

The application of Multi-level Stakeholder Influence Mapping (MSIM) in Nepal’s agricultural climate change adaptation regime demonstrates that analysis with central level respondents alone risks both sub-optimization and advocacy analysis, and tends to focus discourse towards adaptation planning and financing and away from implementation. Using ‘traditional’ power mapping strategies, then, to identify key entry points or agents to lobby could risk adoption of sub-optimal on-ground adaptation responses, and be biased toward the interests of status-quo, central level interests. Yet local level power analyses alone do not offer a solution to the ontological and teleological dilemmas. Local level analyses can ignore important macro-structures that ensure access to central level funding, and that allow for the organized scaling-up of appropriate adaptation options. Advocacy analysis also emerges at local actor levels, with micro-political and geopolitical considerations emerging in this case study.

MSIM advances on existing power-elucidating techniques in that its individual interview style mitigates against group normalization and status-quo bias, its use of an elicitation object facilitates the sharing of sensitive information, and it serves as a useful technique in delineating system boundaries as perceived by different actor groups. MSIM offers a variety of ‘lenses’ through which to analyze power mapping data. It holds the potential to identify powerful but ‘marginalized’ actors and bridging agents, such as local traders or officials, who may be facilitating key adaptation processes, but who are not recognized by central level actors and institutions. Ultimately, it is argued here, without proper consideration of the role of power in agricultural climate change adaptation regimes, that the resulting interventions will be insufficient and potentially contradictory in moderating the negative impacts of climate change, as well as highly contested, less equitable, and ultimately less sustainable and effective. It is likely that the insights emerging from MSIM analyses can improve adaptive capacity of agricultural and other systems by highlighting the “disconnect” between levels of actors in carrying out adaptation and thereby facilitating the selection of more appropriate, resilient, and sustainable adaptation interventions according to genuine local needs and adaptation processes.

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