

Institutional capacity for long-term climate change adaptation: evidence from land use planning in Albay, Philippines

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Abstract Mainstreaming climate change adaptation (CCA) into plans and programs is still a new approach in adaptation and thus there is limited information on how to operationalize it on-ground. This paper addresses this gap by investigating the challenges in mainstreaming CCA into the local land use plans in the province of Albay, Philippines. Specifically, this paper developed 20 quantitative “mainstreaming indicators” to assess the state-of-play and the challenges for local mainstreaming. These indicators were classified under three groupings, namely, the information, institutional, and resource capacities of systems. Qualitative analysis of the indicator scores suggested that developing the institutional capacities of local governments is crucial in the local mainstreaming process. Likewise, the results highlighted the “institutional issues” indicator as the primary barrier in operationalizing the approach. These institutional issues are: fragmented laws and regulations; overlapping policy requirements; and the lack of guidelines for mainstreaming CCA into the local land use plans.

Meanwhile, the “leadership” indicator, as signified by a climate change champion in Albay, was evaluated as an opportunity for local mainstreaming. The champion effectively led the CCA efforts because the existing institutional mechanisms supported the champion’s capacity to influence the behavior of people and produce collective action towards CCA.

Keywords Mainstreaming challenges · Adaptation indicators · Barriers · Opportunities · Institutions

Introduction

One of the key challenges in climate change adaptation is the tendency of individuals to resist and delay change, or the failure of institutions to create an enabling environment that can promote efforts to plan for and respond to the effects of a changing climate. For this reason, improving an adaptation approach through existing schemes is more appropriate than designing and creating new or separate institutions for managing climate change adaptation (CCA) (Klein et al. 2005). Mainstreaming adaptation into short- and medium-term development policy decisions is now becoming a popular climate change response as the strategy integrates CCA into existing government programs; thus, it ensures the sustainability and impact of local interventions (Persson and Klein 2008). A growing number of advocates among international funding agencies and developing countries (e.g., Bangladesh, Cook Islands, the Philippines, Thailand, and Vietnam) are now recognizing the advantages of mainstreaming (UNDP-UNEP 2011; Lebel et al. 2012).

Local land use planning is one of the several avenues by which CCA can be mainstreamed. It has been referred to as the “constitution for future development” (Tang et al.

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2009: 368) since it encompasses most of a locality's planning area, affects significant development concerns, reflects the community's development goals, and represents the future direction of public policies. Also, land use planning is a key tool for sustainable development, efficient use of limited resources, disaster preparation, and hazard management amidst climate change conditions (Klein et al. 2005; Bajracharya et al. 2011). Thus, mainstreaming CCA into land use plans is expected to develop the capacity of localities to respond to the challenges and impacts of climate change (Klein et al. 2005; Enemark et al. 2010).

However, although mainstreaming CCA has been the subject of academic inquiry, there is less research focus on the barriers in operationalizing the approach (OECD 2009; Mangoyana et al. 2012). This is further aggravated by the lack of information on the practical procedures or guidelines for on-ground implementation of the mainstreaming endeavor (Measham et al. 2011). This is true especially for developing countries such as the Philippines (Mercado 2011). Thus, this paper aims to investigate mainstreaming of CCA into local land use plans in Albay, Philippines, focusing on the challenges encountered in the mainstreaming process.

First, a brief background on climate change impacts in the Philippines is presented. Next, the modification of Ostrom's Institutional Analysis and Development (IAD) framework to suit the analytical needs of the study is discussed. This section also identifies the challenges in mainstreaming CCA that were incorporated in the modified IAD, thereby transforming the framework into IAD-CCA. Afterwards, the study's methodology is outlined, including the summary of how the mainstreaming challenges were converted into quantitative mainstreaming indicators. The quantitative aspect of the study aims to determine the conditions on-ground and therefore serves as a guide in prioritizing efforts toward an effective mainstreaming process.

This paper focuses on the primary barrier (i.e., *institutional issues*) and the substantial opportunity (i.e., *leadership*) for mainstreaming CCA that were highlighted by the mainstreaming indicators. CCA is generally viewed as a technical problem; hence, most adaptation studies have focused on assessing the environmental impacts of climate change and the resulting vulnerabilities due to the system's biological risk exposure to these hazards (Resurreccion et al. 2008; Lebel et al. 2012). However, climate change and CCA are challenges about "leadership, coordination, and collective action," and thus are about institutions (Evans and Stevens 2009: 2). Regardless of the existing technology, information, and financial and human resources, weak and inefficient institutional structures can significantly constrain the success of an adaptation measure (Inderberg and Eikeland 2009; Ayers et al. 2014). This paper verifies the significance of institutions in the context

of CCA through quantitative indicators and qualitative assessments. Accordingly, the paper concludes that developing the institutional capacity of systems is crucial to the mainstreaming process, thereby supporting the notion that institutions are fundamental in CCA.

The climate change context in the Philippines and Albay province

The Philippines is a developing country in Southeast Asia with 7100 islands, and experiences an average of 20 typhoons a year (Evasco and Alejandro 2010; Salceda 2012). The historical tropical cyclone data (1948–2004) collected by the Philippine Atmospheric, Geophysical, and Astronomical Services Administration indicated significant variations in the intensity and frequency of typhoons that enter the Philippine Area of Responsibility (Amadore 2005). These changes have been attributed to climate change; and it is predicted that the Philippines may be hit with more super typhoons in the future (World Bank 2013). In November 2013, Typhoon Yolanda (International name: Haiyan) crossed the country and set new records for maximum sustained wind speed and gustiness (David et al. 2013). According to the National Disaster Risk Reduction and Management Council (2014), it affected around 16 million people, with 6300 casualties, 28,689 injured, and 1061 missing individuals, and caused damages estimated at PHP 89.6 billion (USD 2.1 billion).

Prior to 2009, CCA concerns were not integral parts of key national development plans and policies in the Philippines. Hence, efforts to link climate change and sustainable development were limited (Lasco et al. 2009). However, due to the threats posed by climate change, the country has been institutionalizing a number of adaptation measures, including mainstreaming CCA (CCC 2011). Specifically, mainstreaming has been highlighted as an adaptation approach by virtue of the Climate Change Act of 2009, which mandates the government to integrate climate change concerns into its policy making, planning, and other decision-making processes. The mainstreaming approach was further prioritized through the Disaster Risk Reduction and Management Act of 2010 that decrees both the national and local government units to mainstream disaster risk reduction (DRR) and climate change in the development process; hence, the CCA-DRR agenda of the country. Integrating CCA and DRR can result in efforts beyond responding to disasters, providing emergency relief, and recovery, such as planning ways to prevent and reduce risks and vulnerability to climate change related disasters (Lebel et al. 2012).

However, mainstreaming CCA-DRR is a relatively new initiative in the Philippines, being in play only less than a

decade. Thus, guidelines on how to implement the approach at the local scale are very limited (OECD 2009; Mercado 2011). Since local government units (LGUs) are mandated by the law to mainstream CCA into their respective development plans, they have called for assistance to implement mainstreaming in practice, especially in land use planning (RDC XII 2012). Hence, operationalization of mainstreaming in the Philippines is still at its early stages and is a work in progress.

The LGUs in the Philippines are comprised of municipalities (towns), cities, and provinces (NSCB 2014). One of the provinces in the country actively pursuing CCA-DRR initiatives is Albay. In 2010, Albay had a population of 1.2 million living in its 2554 square kilometer land area (NSO 2010; Espinas 2013). The incidence of poverty among families in Albay in 2012 was 33.9 %, about 14.2 percentage points higher than the national incidence (NSCB 2013). Agriculture is the key economic sector in the province, with coconut, rice, sugar and abaca among the province's main products (Espinas 2013).

Albay is very vulnerable to climate-related disasters. Approximately 15–25 % of the typhoons that cross the Philippines directly affect this area, and some of these are among the strongest recorded in the country (Evasco and Alejandro 2010). Typhoon Reming (International name: Dorian) in 2006 left the province with 1023 dead and several hundreds missing, and caused damages estimated at PHP 3.2 billion (USD 64.2 million) (Evasco and Alejandro 2010; Salceda and Rangasa 2011).

Albay, located at the southernmost tip of the main island of Luzon, is around 550 km (km) from the country's capital, Manila (Espinas 2013). The province is mostly surrounded by the Pacific Ocean (east), Samar Sea (southeast), Sibuyan Sea (southwest), Lagonoy Gulf (northeast), and the Burias Pass (west) (Evasco and Alejandro 2010; Uy et al. 2011). Most of its municipalities (towns) and barangays (villages) along its 364 km coastline are exposed to storm surges during typhoons and other extreme events (Salceda and Rangasa 2011; Lasco et al. n.d.). These conditions set mainstreaming CCA into the local land use plan or the Philippine equivalent, the comprehensive land use plan (CLUP)—the primary document that contains the physical framework and fundamental basis of spatial development of an LGU—as a very crucial planning endeavor in Albay (HLURB 2001; Interviews 2014).

Modified Institutional Analysis and Development (IAD) framework for Mainstreaming CCA

This paper utilized Ostrom's Institutional Analysis and Development (IAD) framework as its primary analytical tool. IAD examines institutional settings or those situations

that involve people interacting together in a particular context and following certain rules (Ostrom 2007). The framework was deemed most suitable for the study since mainstreaming CCA is fundamentally an institutional issue (OECD 2006; Agrawala and van Aalst 2006; UNDP-UNEP 2011). The institutional dimension of mainstreaming emanates from the: governance arrangements involved in the mainstreaming efforts; institutional settings where the mainstreaming policy is operationalized; strategies for applying the adaptation measure; and the varying institutional levels and scales where the approach is applied (Brondizio et al. 2009; Theesfeld et al. 2010; Bettini et al. 2012).

IAD is a “multi-tier conceptual map” that defines the significant structural variables present in all institutional arrangements, and identifies the importance of the arrangements relative to one another (Ostrom 2011: 9). IAD's focal point of analysis is the action arena, which is composed of institutional arrangements and the actors that follow these arrangements (Ostrom 2007; McFadden et al. 2010). Other elements of the IAD include the: exogenous variables (i.e., biophysical conditions, community attributes, and rules-in-use) that influence the action arena; the patterns of interaction produced in the action arena; the particular outcomes generated by the patterns of interaction; and the evaluation criteria that outline how patterns of interactions and outcomes are analyzed (Dick and Meinzen-Dick 2011).

In this study, the land use planning system was treated as the action arena. Based on the existing actors and institutional arrangements in this system, the authors assessed the patterns of interaction and the outcomes from these interactions (McGinnis 2011; Ostrom 2011). IAD is a flexible framework with a design that can be modified to accommodate the specific needs of the problem being addressed. Thus, similar to the works of Rudd (2004), Ratner et al. (2013), and Jones et al. (2013), the authors adjusted the evaluation criteria of the IAD to reflect the factors that exemplified the challenges in mainstreaming CCA (i.e., mainstreaming challenges). The evaluation criteria determined which outcomes were satisfactory or substandard. This change transformed the IAD into the IAD-CCA framework (Fig. 1).

To identify a robust set of mainstreaming challenges, this study investigated around 80 peer reviewed papers and over 60 book chapters, conference papers, international agency reports, and discussion papers on CCA in general, and mainstreaming, in particular. Some studies on CCA and mainstreaming, at both the national and local scales, identified common challenges such as lack of organizational cohesion (organizational fragmentation), knowledge and awareness of climate change risks, availability of and access to technical information, competing priorities, and

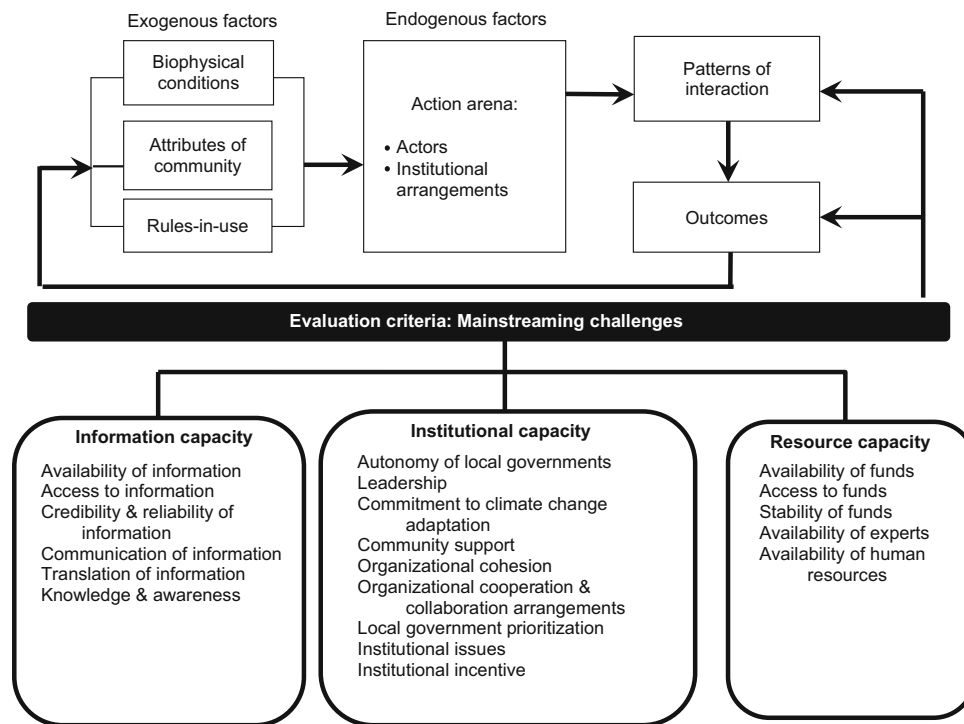


Fig. 1 Institutional Analysis and Development framework for climate change adaptation (IAD-CCA): examining the challenges in mainstreaming climate change adaptation at the local scale. *Source:* Cuevas et al. (2015)

availability of and access to financial resources (Pini et al. 2007; OECD 2009; Duff 2011; Measham et al. 2011; Nambi and Prabhakar 2011; UNDP-UNEP 2011). Meanwhile, communicating and translating technical information, having credible and reliable climate information, and the availability of a legislative framework and mandates for adaptation were issues in CCA at both the national and local scales (Cash et al. 2003; Mukheibir and Ziervogel 2007; Duff 2011; Jones et al. 2013). Other research found community support and participation, stability of funds, human capacity and expertise, commitment to adaptation and political autonomy to be specifically significant to local CCA (Mukheibir and Ziervogel 2007; Pini et al. 2007; Measham et al. 2011; Bryan and Behrman 2013). Lastly, some studies revealed that the incentive to integrate CCA is important in mainstreaming in general, whereas institutional related concerns are particularly vital in operationalizing mainstreaming at the local scale (OECD 2009; Chevallier 2012).

Based on these studies, the authors identified 20 mainstreaming challenges. The literature suggests a link between the challenges in adaptation and the system's adaptive capacity (Adger 2000; Adger et al. 2005; Smit and Wandel 2006). Essentially, adaptive capacity—or the ability of a system to adjust to climate change—is affected by the capability of systems to overcome the barriers and

take advantage of the opportunities for CCA (Klein et al. 2014). Improving adaptive capacity will reduce the system's vulnerability, and consequently decrease the risks associated with climate change (Adger 2000; Smit and Wandel 2006; Cuevas 2011). Based on these notions, the mainstreaming challenges were summarized into three adaptive capacity classifications, namely, information, institutional, and resource capacities. Information capacity deals with the ability of a system to integrate climate change information (i.e., technical and scientific knowledge and data) into land use data. Institutional capacity pertains to the rules, social structures, and organizations involved in mainstreaming CCA. Finally, resource capacity focuses on the financial and human resources that ensure the maintenance and continuation of the integration process. This paper highlights 20 mainstreaming challenges which, under the context of this research, are considered as significant factors that affect the effective operationalization of mainstreaming CCA.

Essentially, the IAD-CCA framework maintains the basic elements of IAD, and thus follows the basic mapping technique of Ostrom's IAD for stakeholders, institutional structures, and for the processes involved in the mainstreaming and local land use planning institutional settings (i.e., situations involving people interacting together in a particular context and following certain rules) (Ostrom

2007; McGinnis 2011). The framework’s modified evaluation criteria provided the study with an outline of mainstreaming challenges to investigate.

Methodology

The authors applied a mixed method approach—quantitative and qualitative—to examine the challenges in mainstreaming CCA-DRR into land use planning in Albay province. This method involved four stages and applied triangulation by data sources (i.e., survey, in-depth interviews, consultation with key informants, and document reviews) (Meijer et al. 2002; Yin 2014). The four-stage mixed method was a systematic and practical process. Each stage in the methodology produced its own output. Stage 1 developed the IAD-CCA framework; Stage 2 generated the quantitative mainstreaming indicators; Stage 3 devised the varying levels of severity by which the challenges (as represented by the quantitative indicators) impact the mainstreaming process; and Stage 4 produced the qualitative analyses of the challenges in mainstreaming CCA. Likewise, each stage was an important part in a chain of actions within the methodology, in which an output of one stage was an input into another stage (Fig. 2).

Stage 1

In Stage 1, documents on adaptation were reviewed to compile a list of mainstreaming challenges and key informants were consulted to verify the significance of this list. Based on this information the original evaluation criteria of the IAD were replaced with 20 mainstreaming challenges, transforming the framework into the IAD for mainstreaming CCA research (IAD-CCA). The IAD-CCA was used as a guide in designing the activities in the next stages of the research, such as the survey questionnaire in Stage 2. That is, each question in the survey represented a challenge in the IAD-CCA evaluation criteria.

Stage 2

A survey that focused on the respondents’ assessment of the local mainstreaming progress was conducted in Stage 2. Scorecards were applied to quantify the participants’ responses. Each survey question had three answer choices that illustrated a possible condition surrounding the mainstreaming challenge. The worst condition was given a score of 1 and the best possible state was assigned a score of 3. Accordingly, each mainstreaming challenge was converted into a quantitative mainstreaming indicator that can have a

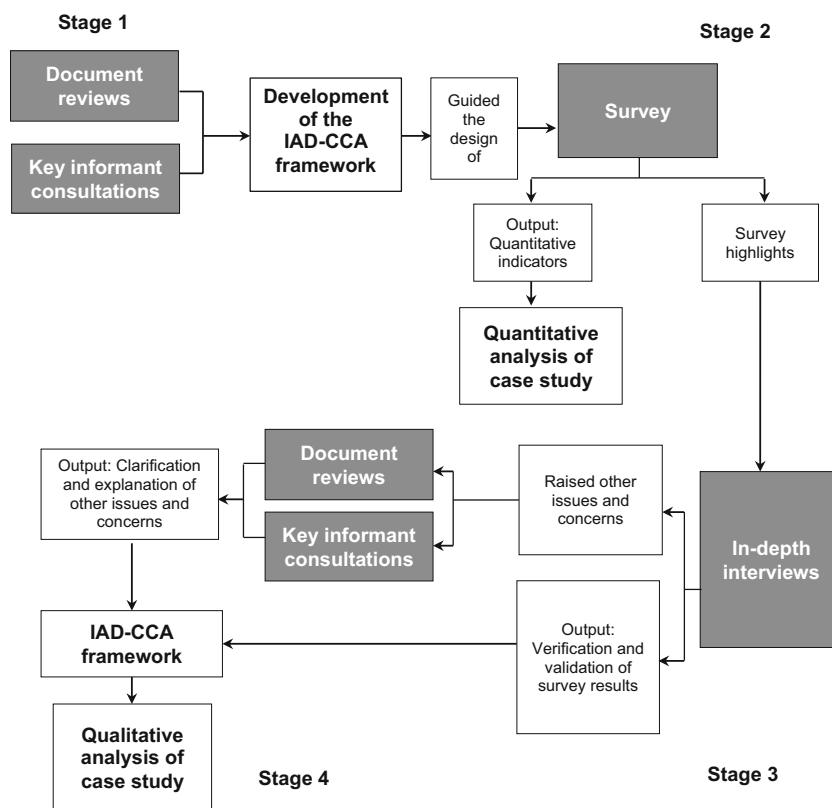


Fig. 2 Research methodology flow chart. Source: Cuevas et al. (2015)

value ranging from $1 \leq n \leq 3$. Equal weights were applied to the answers supplied by the survey respondents. Using the statistical software STATA, Cronbach's alpha statistics—a popular method to measure the reliability of estimates for indices—was computed. Alpha (α), expressed as a number between 0 and 1, measures the internal consistency of a test or scale items in a survey to gauge the survey's reliability (Gliem and Gliem 2003; Tavakol and Dennick 2011).

To narrow the research coverage, the survey was designed to investigate the mainstreaming conditions under Step 7—Preparing the Land Use Plan—of the 12-step process to comprehensive land use planning that is followed by all the LGUs in the Philippines. The CLUP is developed at the municipal and city levels (i.e., Municipal/City Planning Development Offices [M/CPDO]), while the plans are reviewed and approved at the provincial level (i.e., Provincial Land Use Committee [PLUC]) (HLURB 2006). Due to time and financial limitations, only the representatives from Legazpi City and Camalig municipality—LGUs whose CLUPs were with and without CCA-DRR components, respectively—were included as respondents for the city/municipal level.

A purposive sampling technique was applied to ensure that the respondents were knowledgeable on mainstreaming CCA into the CLUP. Thus, the respondents were comprised of the members of the M/CPDO at the city/municipal scale and the members of the PLUC at the provincial scale (i.e., Provincial Planning and Development Office, Albay Public Safety and Emergency Management Office, the subnational offices of the Housing and Land Use Regulatory Board, Department of Interior and Local Government, Department of Environment and Natural Resources, and the Provincial Agriculturist). To obtain the perspective of individuals outside the planning system of Albay, key project personnel at the national level involved in activities and programs for mainstreaming CCA into the CLUPs were also included in the survey, along with some experts on CCA and/or land use planning (i.e., Housing and Land Use Regulatory Board, Climate Change Commission, National Economic and Development Authority, UN Human Settlement Programme, Philippine Institute of Environmental Planners, and the University of the Philippines Los Baños; Table 1).

The difference in perspective (i.e., national issues vis-à-vis local issues in other LGUs) was qualified in the interviews conducted among the national respondents.

Snowball sampling or chain referral sampling was used for additional survey respondents (i.e., subnational offices of the Environment and Management Bureau, Mines and Geosciences Bureau, and Department of Agrarian Reform, the City Disaster Risk Reduction Management Council [Legazpi], and the Municipal Disaster Risk Reduction and Management Officer [Camalig]. The search for local respondents was halted when respondents started referring people who had already been surveyed/interviewed.

Stage 3

The same respondents as that of the survey acted as the interview respondents. Particularly, five were interviewed among the nine survey respondents at the national scale; 11 among 13 respondents at the provincial scale; and five were interviewed among the seven survey respondents at the city/municipal scale. The computed mainstreaming indicator scores established the direction of the semi-structured in-depth interviews in Stage 3, that is, the interviews focused on the mainstreaming indicators that scored closest to either 1 or 3. In turn, the data gathered from the interviews verified and validated the mainstreaming indicator scores. A classification of the mainstreaming indicators was devised based on the assessments made during the interviews. This four level classification depicted the varying levels of severity by which the challenges (as represented by the indicators) impact the mainstreaming process; each level signified the transition of the challenges from barriers to opportunities for mainstreaming. The first-level mainstreaming indicators (i.e., with scores $1.0 \leq n < 2.0$) characterized the primary barriers that constrained the effective integration of CCA into the local planning system. Second-level mainstreaming indicators (i.e. with scores $2.0 \leq n < 2.25$) were less significant than the primary (barriers) but were considered to be serious problems. Meanwhile, the third-level mainstreaming indicators (i.e., with scores from $2.25 \leq n < 2.5$) represented those challenges that were transitioning from barriers to opportunities for mainstreaming. Finally, the fourth-level

Table 1 Data collection scheme: Data source, scale, and coverage

Data source	City/municipal government	Provincial government	National government	NGOs	Academe	Research
Survey	7	13	5	2	2	–
Interviews	5	11	3	0	2	–
Key informants	0	0	3	3	8	–
Documents	20	13	46	5	11	331

Cuevas et al. (2015)

mainstreaming indicators (i.e., with scores ≥ 2.5) indicated those challenges that the system had already overcome, had positive effects on the implementation process, and, therefore, were considered as opportunities for mainstreaming. Additional issues and concerns regarding the mainstreaming process were also raised during the interviews.

Stage 4

Stage 4 had two components—additional data collection and the qualitative analysis. Supplementary information to support the survey results and interview assessments were acquired by consulting with key informants (i.e., Department of Budget and Management, the Civil Service Commission, and the Climate Change Commission) and by reviewing documents such as national and local laws and regulations, government memoranda, LGU reports, and other related studies. Then, all the information gathered in Stage 2 (survey data and mainstreaming indicators), Stage 3 (interview assessments), and Stage 4 (consultations and document review results) were qualitatively analyzed using the IAD-CCA framework as a guide. For example, the mainstreaming indicator that garnered the lowest score (i.e., closest to the value of 1) was examined first. The responsibilities and linkages among the key actors involved in this challenge were then identified. Next, the institutional arrangements that guided the actions of these actors were mapped to determine their patterns of interactions. Subsequently, the outcomes of these patterns of interaction were determined. The underlying issues related to the patterns of interaction and outcomes were examined to further understand the score associated with the mainstreaming challenge.

Results: evaluating the challenges in mainstreaming CCA into local land use plans

This section presents the mainstreaming indicator scores and the interpretation of these scores. First, it discusses the Cronbach’s alpha (α) statistics computed to determine the reliability of the indicator estimates (in Stage 2). Specifically, $\alpha > 0.9$ is considered as excellent; $\alpha > 0.8$, good; $\alpha > 0.7$, acceptable; $\alpha > 0.6$, questionable; $\alpha > 0.5$, poor; and the value of $\alpha < 0.5$ as unacceptable (Gliem and Gliem 2003). Analysis on the entire dataset resulted to $\alpha = 0.8595$. Alpha on the data subsets—national, provincial, city/municipal—was also computed, resulting to α equal to 0.8097, 0.9487, and 0.9001, respectively.

The indicator scores (Fig. 3) suggested that the primary barriers to mainstreaming CCA into the CLUPs in the Philippines, and Albay in particular, are linked to institutional capacity (i.e., *institutional issues*). Discussions during the in-depth interviews conducted in Stage 3 revealed that these issues include: fragmented national laws and regulations; overlapping or multiplicity of policy requirements; and a shortage in guidelines for mainstreaming CCA into the CLUP. The issues all relate to the lack of institutional mechanisms that support the mainstreaming initiative. Another identified institutional issue is associated with political concerns (i.e., decision-making influenced by personal interests of politicians). The scores also implied that the *availability* and *access to information* were among the major challenges that should be prioritized; hence, these signified the importance of building the information capacity of localities. Conversely, the *credibility and reliability of information* and *stability of funds* were considered as opportunities for mainstreaming.

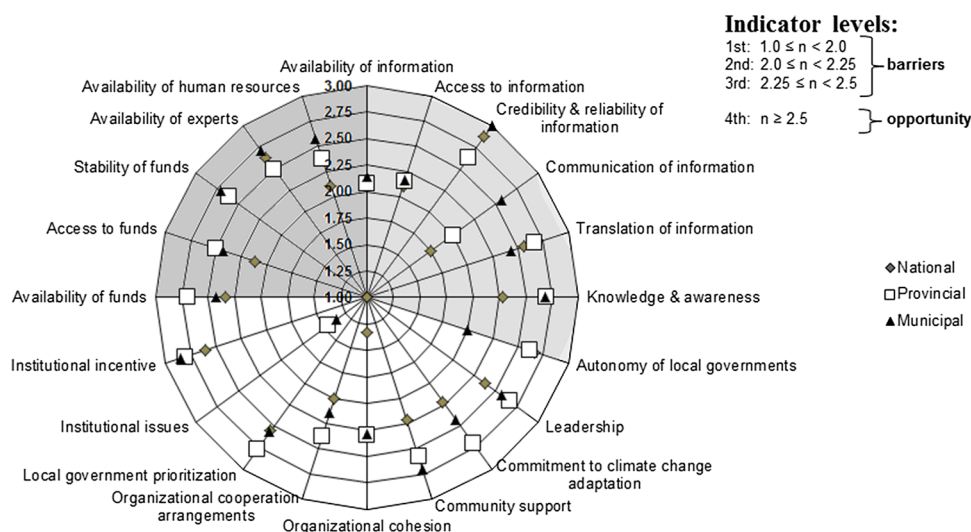


Fig. 3 Assessing the mainstreaming indicators: barriers or opportunities. *Notes* Figure shading represents the three indicator classifications: dark gray resource capacity, light gray information capacity, white institutional capacity

Some variations in the assessments across scales reflected the differences in the conditions in Albay (both provincial and city/municipal) and other LGUs in the country, particularly in terms of the following: *knowledge and awareness*, *leadership*, and *community support*. These indicators were assessed as opportunities at the provincial and city/municipal scales, but were barriers at the national scale. Similarly, the *commitment to CCA* and *accessibility of funds* were opportunities at the provincial scale, but were second-level barriers at the national scale. These differences were caused by the existence of a climate change champion in Albay (i.e., *leadership* indicator), in the person of the provincial chief executive, Governor Jose Clemente Salceda. Other indicator scores reflected the national versus local perspectives, that is, the national respondents generally reacted to the question in terms of the national institutions involved in climate change and land use planning. On the other hand, the local respondents (i.e., provincial and city/municipal) evaluated the question in relation to the local institutions in Albay. This case applied to the *organizational cohesion*, *local government prioritization*, and *institutional incentive* indicators.

Based on the interviews conducted in Stage 3, the scores of *communication of information*, *translation of information*, *autonomy of local government*, and *organizational cooperation and collaboration arrangements* indicators had to be clarified at the individual scale. That is, the issues encompassing the indicators could not be generalized across scales and had to be investigated from the national to the provincial and to the city/municipal scales. Lastly, the interview results suggested that the scores on the *availability of funds*, *experts*, and *human resources* could not be taken at face value. These required supplementary information and analysis to determine the “true” conditions surrounding the challenges. For example, scores on the *availability of funds* were based on questions concerned with the availability and regularity of funds for mainstreaming activities. The interview results showed that although funds were available, they were not sufficient to finance the various adaptation needs of the LGUs. Likewise, what these funds were allocated for was not explicitly defined. The same argument applied to the *availability of experts* and the *availability of human resources* indicators. The interviews also disclosed that although climate change experts were available, their numbers were insufficient to effectively address the needs of all LGUs. Similarly, the respondents reported that there were deeper institutional concerns, other than the availability of local personnel to undertake CCA activities, which hindered the mainstreaming process. This last point is expounded in the next section, which presents the qualitative analysis (Stage 4) of the indicator scores.

Discussion: significance of developing institutional capacity for mainstreaming CCA

This section presents the core on-ground conditions relating to the two indicators—*institutional issues* and *local leadership*—highlighted as the primary barrier and substantial opportunity, respectively, for mainstreaming CCA into the CLUP. *Institutional issues* refer to the absence or presence of rule-based institutional questions or conflicts that inhibit the effective integration of CCA into local land use planning, while *leadership* pertains to the absence/existence of a CCA “champion” in the locality and the extent of the champion’s influence on the community’s behavior. The succeeding discussions present the qualitative analysis (Stage 4) conducted on all the data gathered using the IAD-CCA as the analytical guide. Specifically, the local land use planning system (i.e., action arena) in Albay was analyzed; hence, the interplays and interactions between and among the rule-based and institutional organizations connected to each mainstreaming indicator (*institutional issues* and *local leadership*) were examined; and the existing and introduced institutional arrangements governing the actions of these institutions were explored.

Institutional issues

The key institutional issues identified during the interviews were: fragmented national laws and regulations; lack of guidelines for mainstreaming CCA-DRR into the local land-use plans; overlapping policy requirements; and political concerns. During the interviews (at all scales), the respondents cited the institutionalization of the Local Disaster Risk Reduction and Management (LDRRM) officer as a key concern in mainstreaming CCA. At first glance, this issue seemed to fall under the *availability of human resources*; however, intensive analysis revealed that this matter resulted from a discord among the regulations affecting the creation of this government position (i.e., fragmented laws and regulations).

Fragmented laws and regulations

By virtue of the Disaster Risk Reduction and Management Act of 2010, all LGUs are mandated to create the LDRRM officer position. The LDRRM officer assumes the tasks and responsibilities related to CCA-DRR at the local level, including spearheading the mainstreaming of CCA into the CLUP. Hence, creating the position in cities and municipalities is critical in advancing local climate change concerns in the Philippines. The Department of Budget and Management identified the funding source for the officer’s personal services requirements (i.e., salaries and

compensations of government employees) to be the LGU fund. However, the usage of the LGU fund for personal services is restricted by the budgetary requirements stipulated in the Local Government Code of 1991; that is, personal services should not exceed about 45–55 % of the funds. This rule poses a significant problem since most (if not all) LGUs have reached their respective budgetary ceilings. This meant that no budget was available to hire a new officer in most LGUs.

Still, LGUs are mandated to comply with the law. Thus, without sufficient financial resources to create a permanent LDRRM officer, LGUs resorted to designating the position to existing regular and permanent LGU personnel. This means that aside from the usual responsibilities of the staff, s/he is given additional tasks and “great accountability especially when there are disasters,” without additional compensation, financial or otherwise. This scenario explains the high score for the mainstreaming indicator *availability of human resources*, especially at the city/municipal level. Hence, although there are available LGU personnel tasked to attend to CCA concerns, these personnel are the designated LDRRM officers who are typically overworked, underpaid, and unmotivated (Interviews 2014).

The few LGUs that do have the funds to create the LDRRM officer position are faced with another institutional constraint, that is, the lack of standards and guidelines for creating such a position. Prior to April 2014, the Civil Service Commission (i.e., central personnel agency mandated to formulate policies and regulations for government employment) has yet to set the said guidelines. In such cases, the local chief executives (i.e., mayors) typically exercise their authority to create casual local government positions “without need of approval or attestation by the Civil Service Commission,” as provided by the Local Government Code. However, this authority is oftentimes influenced by the “padrino” system, the norm or value system of political patronage where a person gives or gains favor, promotion, or political appointment through social (friendship) or familial affiliation, instead of merit and qualifications. These political appointments often result in LDRRM officers with less than the desired knowledge, experience, and appreciation of climate change concerns. In cases where the appointed LDRRM officer is qualified and/or experienced, the temporary status of the position presents another difficulty. As a political appointee, the LDRMM officer is co-terminus with the mayor. Thus, a change in local political power signifies losses in human resource investments, which in this case is the CCA-DRR trained LDRRM officer (Interviews 2014).

In early 2014, these budgetary and guidelines issues were addressed by a multi-agency Technical Working Group (i.e., Civil Service Commission, National Disaster Risk Reduction and Management Development Council,

Department of Interior and Local Government, Department of Budget and Management) that formulated a joint memorandum indicating the implementing guidelines for establishing the Local Disaster Risk Reduction and Management Offices in provinces, cities, and municipalities. While the impacts of the Joint Memorandum are yet to be realized as of this writing, the amendments and the new sets of rules it provides are evidence of institutional mechanisms that support the institutional foundation for CCA.

Lack of guidance for mainstreaming CCA into the CLUP

Another important issue was the lack of guidelines for mainstreaming CCA into the local land use plans. When the Climate Change Act and the Disaster Risk Reduction and Management Act were enacted in 2009 and 2010, respectively, LGUs were then required to produce updated local land use plans with CCA-DRR components. However, the mechanisms to support the laws’ implementation have been insufficient (i.e., lack of guidelines to support the mainstreaming efforts) and the LGUs find it difficult to comply with these laws (Interviews 2014). The operational procedures for mainstreaming CCA-DRR (i.e., Supplemental Guidelines on Mainstreaming Climate and Disaster Risks in the Comprehensive Land-use Plan) were only released by the Housing and Land Use Regulatory Board (HLURB) in early 2014. Thus, during the intervening years, LGUs were unsure of how to fulfill their obligations as required by the legislation. Although the Supplemental Guidelines are expected to improve LGUs’ capacities to mainstream CCA-DRR into the CLUP, its impacts are yet to be determined as of this writing.

Overlapping and multiple policy requirements

LGUs are mandated to comply with approximately 30 sectoral plans as stipulated by various laws, regulations, etc. (Mercado 2011; Table 2). Complying with these rules has been a challenge for LGUs not only due to the lack of resources, but also because LGUs regard some of the mandated plans as repetitive, unnecessary, and generally overwhelming in number (Gotis 2008; Interviews 2014). According to the local respondents, the multiple requirements prevent the understaffed LGUs from focusing on mainstreaming CCA into local plans, including the CLUP.

Political concerns

Politics has also affected the mainstreaming of CCA, particularly when members of councils or the local chief executives decide on CLUP concerns for personal gains. Most of the institutional arrangements created by the Local Government Code provide local politicians with a number

Table 2 Selected local government unit mandated plans and their legal basis

Mandated local plans	Legal basis
Comprehensive Land Use Plan	RA 7279: Urban Development and Housing Act of 1992
Local Shelter Plan	RA 7160: Local Government Code of 1991
Comprehensive Development Plan	RA 7160: Local Government Code of 1991
Local Development Investment Plan	
Annual Investment Program	
Executive and Legislative Agenda	
Local Climate Change Action Plan	RA 9729: Climate Change Act of 2009
Local Disaster Risk Reduction and Management Plan	RA 10121: Disaster Risk Reduction and Management Act of 2010
Local Poverty Reduction Action Plan	RA 8425: Social Reform and Poverty Alleviation Act of 1997 DBM-DILG-DSWD-NAPC Joint Memorandum Circular No. 1 Series of 2012: Policy Guidelines and Procedures in the Implementation of Bottom-Up Planning and Budgeting for the FY 2013 Budget Preparation
Local Solid Waste Management Plan	RA 9003: Ecological Solid Waste Management Act of 2000
Local Tourism Development Plan	RA 9593: The Tourism Act of 2009
Strategic Agricultural and Fisheries Development Zones Plan	RA 8435: Agriculture and Fisheries Modernization Act of 1998
Local Nutrition Action Plan	DILG Memorandum Circular 2012-89: Adoption of the Philippine Plan of Action for Nutrition (PPAN) 2011–2016

RA Republic Act, DBM Department of Budget and Management, DILG Department of Interior and Local Government, DSWD Department of Social Welfare and Management, NAPC National Anti-Poverty Commission

of avenues to influence the land use planning procedure. For one, the Local Development Councils, the main body that formulates the local plan, is predominantly comprised of politicians (Serote 2004). Similarly, politicians rule the legislative body that enacts the plan into zoning ordinances (Sec. 446 and Sec. 457 of the Local Government Code). Sections 54 and 55 of the Local Government Code also authorize local executives to approve or veto local ordinances, including those related to zoning regulations. Hence, local politicians can reject proposals for the conversion or reclassification of lands in critical sites or danger zones when such changes threaten their personal investments located at the sites (Interviews 2014). This practice is predominant in the Philippines where “zoning classifications are likewise the subjects of political trade-offs, compromise, and corrupt practices” (Corpuz 2012: 9).

These issues show that institutions significantly influence the process of mainstreaming CCA into the CLUP. This is further supported by evidence illustrating that an institutional challenge, when transformed into an opportunity, is also key to the effective operationalization of the mainstreaming approach.

Leadership: climate change champion

A key component in local CCA is leadership or the “emergence of an identifiable political/administrative champion(s) for climate change issues” (Roberts 2008:

527). Leadership is a crucial aspect at any stage of the adaptation process; that is, the existence of a climate change champion can be a significant opportunity, whereas the lack of one can weaken the climate change agenda and be a critical barrier to the endeavor (Roberts 2008; Burch 2010; Waters et al. 2014). In this study’s context, the champion may take the form of an institutional organization or an individual whose position symbolizes a social structure-based institution that can form individual and social expectations, and can influence relations, interactions, behaviors, and the conduct of people (Cuevas et al. 2014).

National scale

The *leadership* indicator was assessed as a third-level challenge at the national scale (Fig. 3). The Climate Change Act has institutionalized the Climate Change Commission as the key agency tasked to coordinate, monitor, and evaluate government programs and action plans relating to climate change, thus making the agency the main climate change champion in the country. In relation to land use planning, the Climate Change Commission spearheads the Ecotowns (ecosystems town) project, which is an initiative that aims to develop climate change-resilient towns with improved adaptive capacities. The project also aims to demonstrate the convergence of CCA and mitigation actions, as well as the integrated

ecosystem-based management approach in planning (CCC 2011). Through Memorandum of Agreements, the Climate Change Commission works closely with the 10 LGUs involved in the project. At the beginning (of the project), the mayors of the participating LGUs were a mix of climate change skeptics, non-believers, believers, and individuals who lacked interest in the issue. As the Ecotown project progressed and the Climate Change Commission and LGUs worked together, some of the mayors realized the significance of CCA (in general) and mainstreaming CCA into local plans (in particular). As such, they were influenced to champion CCA in their localities. This development paved the way to more effective and efficient transactions of CCA initiatives (Interviews 2014).

However, the Climate Change Commission is a national agency. Although it can be effective at the national level, it has limited impact at the local level. Therefore, for the on-ground mainstreaming of CCA initiatives, having a climate change champion at the local level is a significant factor. This is confirmed by the evidence from Albay.

Local scale: Albay province

By virtue of the Local Government Code, LGUs in the Philippines have extensive local autonomy. The provisions of this law offered Governor Salceda the essential institutional support to advocate and execute CCA initiatives effectively in the province of Albay. For example, the law provides the provincial governor with the authority to call for conventions, conferences, seminars, or meetings on concerns s/he deems significant to promote the general welfare of the province and its constituents [Sect. 465 (b) (2)]. Thus, in 2007, the Provincial Government of Albay assembled government officials, academics, researchers, NGOs, the business sector, local community representatives, and donor communities into the First National Conference on Climate Change Adaptation to discuss the climate change agenda. The conference resulted in the “Albay Declaration on Climate Change Adaptation” that called for the early passage of the Climate Change Act, and consequently the creation of the Climate Change Commission. In 2009, the provincial government again organized and co-hosted the Second National Conference on Climate Change Adaptation (Benson 2009; Salceda and Rangasa 2011). These activities, along with numerous others, helped raise the *knowledge and awareness* of the public on climate change issues and gain *community support* on CCA endeavors. This condition is expected to assist the people, who will be affected by modifications in the CLUP, to understand the need and significance of the changes.

Also, the Local Government Code provides the provincial governor with executive and legislative

authority over his/her jurisdiction. Hence, Governor Salceda, through the powers of his position, implemented and influenced a number of CCA-DRR initiatives. For example, Governor Salceda promoted mainstreaming CCA-DRR into the CLUP through the Provincial Executive Order 2007-07, which incorporates the Mines and Geosciences Bureau and the Environmental Management Bureau in the PLUC. These two agencies are among the key government institutions that generate climate change-related data. Likewise, through the Provincial Executive Order No. 2008-03, the Albay Public Safety and Emergency Management Office also was included in the committee. These developments helped ensure that CCA-DRR was incorporated in the revised CLUPs of LGUs. Likewise, the legislative actions helped improve *organizational cohesion* in the province’s land use planning system by clarifying the responsibilities of various institutions concerning the mainstreaming of CCA. Hence, the indicator was assessed as a third level barrier in Albay, illustrating its transition from a potential primary barrier toward becoming an opportunity for mainstreaming.

Moreover, a Memorandum of Agreement between the PGA and Bicol University has established the Climate Change Academy (now known as the Climate Change Adaptation and Disaster Risk Reduction and Management Training Institute) as Albay’s main arm in enhancing and strengthening the knowledge and skills of major local stakeholders on climate and disaster risk assessment. This was followed by the Provincial Executive Order 2011-02 that stipulates the Climate Change Academy was to hold environmental classes at the key university in the region (i.e., Bicol University) starting 2011. Like the activities that promoted the dissemination of climate change information, these policies enabled land use planners to become more knowledgeable on climate change concerns. Such understanding helped them to see the benefits of mainstreaming CCA into the CLUP, *incentivized* them to operationalize the mainstreaming approach, and improved their *commitment to CCA*. Lastly, as a climate change champion, Governor Salceda was able to place CCA-DRR as a priority agenda of the local government, as evidenced by the number of climate change-related activities in the province. Consequently, the *local government prioritization* indicator was assessed as an opportunity at the local scale (provincial and city/municipal).

Summary and conclusions

This paper assessed the state-of-play of the local mainstreaming process in Albay, Philippines. The quantitative aspect of the study provided an evaluation of the conditions on-ground and therefore served as a guide in determining

the challenges that need to be prioritized to effectively mainstream CCA-DRR into the land use planning process. Based on the indicator scores, this paper focused on the *institutional issues* surrounding the operationalization of the approach. The qualitative analysis highlighted why and how institutions can be primary barriers to the local mainstreaming process in the Philippines, as evidenced through the: fragmented national laws and regulations; overlapping and multiple policy requirements; and lack of guidelines for mainstreaming CCA into the CLUPs. These barriers can be summarized as the absence of institutional mechanisms that support the foundations for CCA, specifically the Climate Change Act of 2009 and the Disaster Risk Reduction Management Act of 2010.

Mainstreaming CCA is a change that will require broader institutional reforms. Thus, understanding the planning context where these institutional changes (e.g., creation of new policies or amendments in prevailing regulations) are to be implemented is critical (Theesfeld et al. 2010). For example, the provisions in the Disaster Risk Reduction Management Act with regard to the institutionalization of the LDRRM officer could not be implemented effectively due to budgetary constraints and limited standards and guidelines for implementation. The case implies that institutional mechanisms to support the institutional foundations for CCA are essential to mainstream CCA effectively and to transform mainstreaming challenges into opportunities.

This point is also demonstrated by the circumstances surrounding the *leadership* challenge, that is, the existence of a climate change champion in Albay. A significant feature included in this mainstreaming indicator is the ability of the champion to influence the behavior of people and initiate a collective action. *Leadership* became an opportunity to raise the *knowledge and awareness* of planners, decision makers, and the community on climate change concerns; positively influence the *commitment* of the local governments to CCA-DRR initiatives; place CCA-DRR among the *priority agenda* of the local governments; gain *community support* for CCA-DRR; and provide *institutional incentive* through motivating planners and decision makers to mainstream CCA-DRR into the local plans. Hence, these commonly identified “obstacles to mainstreaming in the Philippines” (Lasco et al. 2008: 14) were transformed into opportunities in Albay. The analysis also suggests that in the Philippines, the local government chief executives are important to champion CCA at the local scale. Vital to this analysis is the recognition that local chief executives, as climate change champions, have the institutional support to initiate and execute a number of CCA-DRR activities, policies, and orders, by virtue of the Local Government Code.

The institutional dimension of climate change is a crucial facet of adaptation (Adger 2000; Lebel et al. 2012). Institutional changes and concerns are among the important factors that determine the success or failure of an adaptation measure, especially at the local level (Orindi and Eriksen 2005). This is particularly true in the Philippine context where the improvements in institutional capacities of LGUs can result in a reduction in climate change-associated risks, and where local government institutions are crucial in facilitating local adaptation (Lasco et al. 2008; Uy et al. 2011; Cuevas 2012). This paper supports this notion and strengthened the significance of developing institutional capacities of systems for a long-term adaptation to climate change.

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