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DESIGNING CLIMATE VULNERABILITY ASSESSMENTS FOR DECISION-MAKING UPTAKE: A CONCEPTUAL FRAMEWORK AND CASE EXAMPLES

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ARCC

African and Latin American
Resilience to Climate Change Project

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AFRICAN AND LATIN AMERICAN RESILIENCE TO CLIMATE CHANGE (ARCC)

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ACRONYMS AND ABBREVIATIONS

ARCC	African and Latin American Resilience to Climate Change
CCVA	Climate Change Vulnerability Assessments
IIED	International Institute for Environment and Development
ISET	Institute for Social and Environmental Transition
NGO	Nongovernmental Organization
USAID	United States Agency for International Development
WRI	World Resources Institute

1.0 INTRODUCTION: MERGING SCIENTIFIC EVIDENCE WITH DECISION-MAKING

Climate change vulnerability assessments (CCVAs) are an important tool to understand the extent and ways that climate change affects ecological and human systems. CCVAs give information on sensitivity and exposure to climate events, and the adaptive capacity of systems to withstand climate hazards and build resilience against climate related changes. Although CCVAs provide critical information to plan for climate change, few decision makers use CCVAs in planning, implementing, monitoring, and evaluating climate change adaptation policies and projects. This is primarily because there is limited interaction between scientists who conduct CCVAs and decision makers who use them. The objective of this paper is to enable scientists and decision makers to link CCVAs with decision making better so that plans and policies are based on scientific evidence derived from CCVAs. The paper discusses the key ingredients needed to merge scientific evidence in CCVAs with adaptation decision making successfully.

This paper provides a framework for understanding the process by which scientists and decision makers integrate CCVAs into adaptation and development policy or planning. The paper uses the term "uptake process" to describe how the CCVA transitions from the design, to implementation, to "uptake" phases to inform policy and programming. The framework comprises three elements:

- **Characteristics** of a CCVA that make CCVAs ready for decision-making. These core characteristics are credibility, salience, and legitimacy.
- **Actors** who play a key role in making uptake happen. These actors include scientists, decision makers, knowledge brokers, and champions who influence the CCVA and the uptake process.
- Two key **influential factors:** communications strategies and decision-making context.

The paper provides examples of how uptake characteristics are established, how actors interact to influence the uptake process, and how influential factors affect the uptake process through case studies from Vietnam, Kenya, and Uganda.

Section 2.0 begins with an overview of the CCVA uptake process. Three stages divide this process: CCVA design, CCVA implementation, and decision making stages. This section describes these stages and suggests how actors, such as scientists and decision makers, can establish the core characteristics of the CCVA to start the uptake process. It also highlights the role of knowledge brokers and champions, context as influential factors, and the role of communication that may affect the uptake process. Sections 3.0, 4.0, and 5.0 provide a deeper examination of the core characteristics, actors, and influential factors respectively. Section 6.0 concludes with a summary of key ingredients needed to merge scientific evidence with adaptation decision making. Most of the examples and points of discussion in this paper are derived from the U.S. Agency for International Development's (USAID) African and Latin America Resilience to Climate Change (ARCC) Experts' Meeting on Climate Change Vulnerability Assessment Utility and Uptake (April 2014), and the World Resources Institute (WRI) Roundtable (June 2014).

2.0 OVERVIEW OF THE CCVA UPTAKE PROCESS AND FRAMEWORK

The CCVA uptake process starts in the *design phase* of the CCVA. The design phase is a time when scientists, in consultation with decision makers, design the CCVA, which includes deciding on research questions to be answered and the scope and scale of the vulnerability assessment. In this paper, scientists include both natural and social scientists. Decision makers constitute a combination of people who represent nongovernmental organizations (NGOs), government agencies from the national to the local levels, development workers, private companies, city dwellers, and/or farmers. Ideally, identifying information needs together in the design phase creates a balance between what scientists feel is important in a CCVA and what decision makers feel is relevant to implementing plans and policies (WRI Roundtable, 2014). Together, decision makers and scientists involved in the CCVA design become informed leaders to define, promote, and implement climate change-responsive policies and programs.

Dialogue between scientists and decision makers begins the process of establishing the core characteristics of the CCVA (see Section 3.0 for details). Credibility, a core characteristic, refers to including high-quality technical information derived from ecological studies, social vulnerability and economic livelihoods assessments, and/or climate and weather projections into the CCVA (ARCC, 2013b; Cash et al., 2003). In the *implementation phase*, scientists usually conduct the CCVA using these tools, such as climate models, livelihood analysis, and participatory mapping, to gather high-quality information. However, scientists and decision makers both establish credibility by discussing whether information collected by scientists is credible through different perspectives. In order to build a bridge between science and decision-making needs, a knowledge broker equipped with the skills to link science and decision-making is required in the uptake process.

The role of the knowledge broker is critical in facilitating a co-development process of the CCVA by merging science with decision making (see Section 4.1 for details). Co-developing the CCVA helps blur boundary lines between scientists and decision makers. The blurring of boundaries helps scientists understand the kinds of decisions decision makers need to make. At the same time, this helps decision makers understand the possibilities and limitations of what science can reveal about vulnerability. Co-developing the CCVA reduces the mismatch between what decision makers expect from the CCVA and the actual results of the CCVA scientists are able to provide. The risk with co-developing CCVAs is allowing decision makers to dictate the terms of the CCVA. Skilled knowledge brokers with technical knowledge of CCVAs and ability to engage with decision makers are able to create balance between what decision makers expect and what scientists can provide. Knowledge brokers create this balance by supporting legitimate participation of both scientists and decision makers in the CCVA design stage.

During the final stages of the implementation phase, scientists provide decision makers the opportunity to review and discuss the CCVA findings. At this time, decision makers begin to identify findings to incorporate into recommendations for adaptation policies and programs. Knowledge brokers facilitate discussion to build credibility and assist in creating relevancy of the CCVA for decision makers.

Early communication of CCVA findings enables decision makers involved in the CCVA to plan adaptation projects in a timely manner. At this stage, CCVA champions start playing a role by communicating and advocating CCVA findings to decision makers (see Section 4.1 for details).

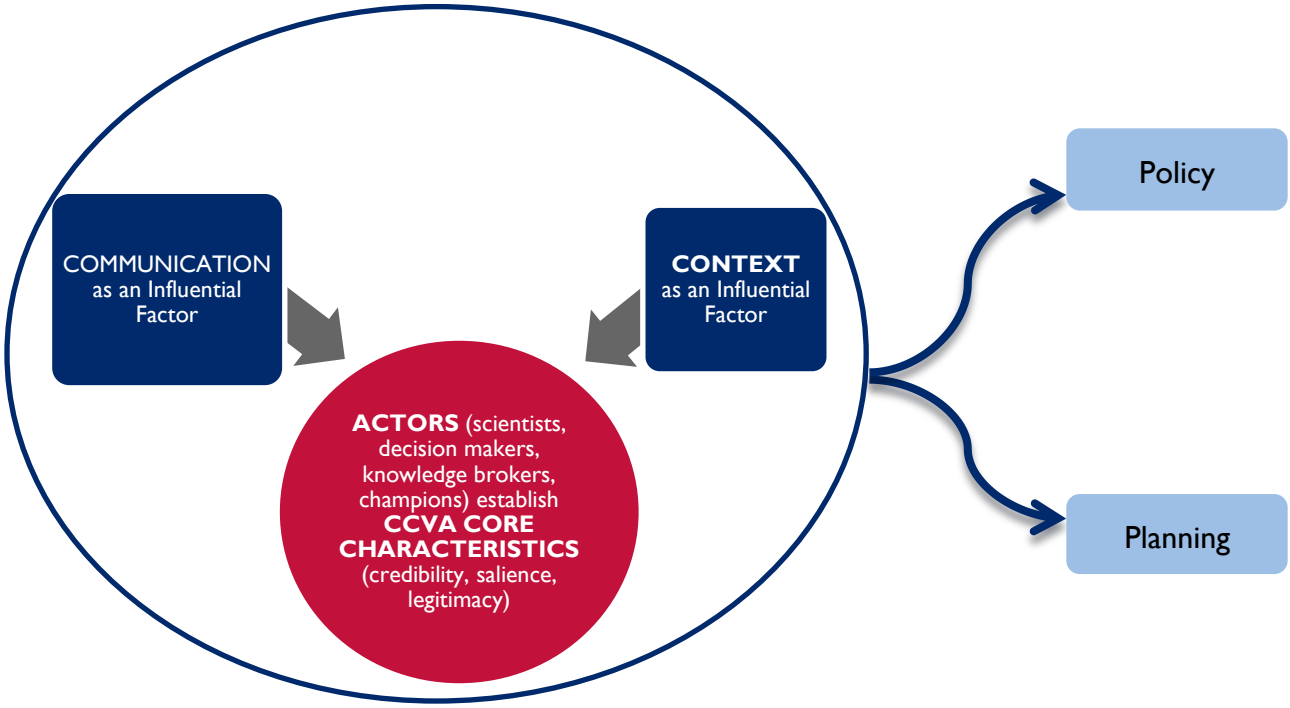
Context is an important influential factor that affects relationships between actors from the design to the decision-making phases (see Section 5.1 for details). The socioeconomic and political situations of an area determine the extent to which the CCVA integrates into decision-making processes. Additionally, the level of dependency of a population on a particular natural resource, level of public participation, availability of finances, organizational structures, and political feasibility also influence how far the CCVA progresses in the uptake process.

Communication continues well into the *decision making phase.* At the decision-making phase, the CCVA is complete, and the focus is on how to incorporate CCVA findings into plans and policies (see Section 5.2 for details). How findings from the CCVA are communicated influences whether CCVA findings are included in plans and policies. For instance, how scientists communicate climate uncertainty determines whether plans and policies include CCVA findings. Decision makers lead this phase while scientists remain involved in the process by helping to communicate CCVA results. In some cases, the same decision maker may not stay throughout the uptake process. This may change the dynamic between scientists and decision makers, thereby affecting the communication and uptake process. Although this is a challenge, continuous communication between scientists and decision makers supported by knowledge brokers and champions can reduce the risk of dissolving the relationship between scientists and decision makers, which is critical.

2.1 THE UPTAKE FRAMEWORK

Based on this overview of the uptake process, Figure 1 on the following page illustrates the CCVA uptake framework, with the core CCVA characteristics of credibility, salience, and legitimacy (red circle) at its center. Knowledge brokers play a facilitating role between scientists and decision makers to create bridges between scientific findings and the needs of decision makers. Influential factors, such as context and communication, depicted by boxes pointing to the core, affect how scientists and decision makers work together to establish the core characteristics and create an "uptake ready" CCVA.

FIGURE 1: A FRAMEWORK FOR UPTAKE INTO POLICY AND PLANNING



The circular form of the framework illustrates that uptake is iterative between actors throughout the uptake process. Uptake into policies and planning does not necessarily occur in a linear fashion (noted by the bending arrows outside of the circle) but through iterations between actors and influential factors.

3.0 CCVA CHARACTERISTICS THAT CONTRIBUTE TO UPTAKE

Establishing three key characteristics of a scientific study can move a study from a design and implementation phase into the realm of decision-making (Cash et al., 2003). The three characteristics are:

- **Credibility:** Refers to the perceived technical quality or adequacy of technical evidence and arguments by users of scientific information. Findings perceived as having high technical quality are likely to be more compelling to a decision maker. In the context of a CCVA, scientists first establish credibility in the design phase by conducting climate analysis using reliable historical climate data and the latest climate modeling procedures to identify climate change trends and minimize the uncertainty of projections. In the design and implementation phases, scientists and decision makers merge and verify scientific understanding of climate change.
- **Salience:** Refers to the perceived relevance of the technical information provided to decision makers. If scientific documents do not provide information needed by decision makers in a timely manner, then the relevance of the scientific information could be lost. Scientists and decision makers establish salience when they begin to collaborate in the design phase of the CCVA and maintain salience well into the decision making phase through constant interaction and dialogue.
- **Legitimacy:** Refers to the process of collecting scientific information through participation of various actors in a balanced manner. Legitimacy is established when scientists and decision makers include a wide range of perspectives to corroborate the design and validate the CCVA findings. For example, validating climate trend analyses with real world experiences of climate change—e.g., by affected farmers and herders—can increase the legitimacy of the scientific analyses.

In many cases, one core characteristic of the CCVA becomes more prominent than other characteristics. For instance, establishing credibility may not translate into building salience if the technical information is not relevant to CCVA users. Salience is difficult to establish if participants do not engage legitimately in the CCVA process in the design phase when scientists and decision makers formulate research questions. Therefore, those conducting the CCVAs need to balance these characteristics for an "uptake ready" CCVA.

Credibility, salience, and legitimacy are highly linked and complementary. For instance, establishing credibility is not only about ensuring that high quality technical data exists in the CCVA but it also means allowing stakeholders to legitimately debate the information in the CCVA to ensure that it is accurate and objectivity is maintained. Similarly, in order to establish salience or relevance of the CCVA, multiple decision makers must participate in the CCVA process in a legitimate manner to create a scientific product that is relevant and useful for those involved in the process and beyond. The Annex provides examples of how scientists and decision makers established these core characteristics in the uptake process in Uganda, and Vietnam.

4.0 ACTORS CONNECTING SCIENCE TO DECISION MAKING

4.1 ROLES OF KNOWLEDGE BROKERS AND CHAMPIONS

In addition to scientists and decision makers who lead the CCVA process, knowledge brokers play a critical role in building bridges between science and decision-making. Knowledge brokers are usually scientists in academia or in research institutes. They make scientific information more accessible and understandable to decision makers allowing science to merge with decision-making processes (Cash et al., 2003; Guston, 2001; Hammill, Harvey, and Echeverria, 2013; Jasanoff, 1996). Knowledge brokers are able to create this bridge because they possess both technical skills that allow them to provide scientific input into the in CCVAs and skills to convey findings from the CCVA in a manner that will allow decision makers to use the CCVA (ARCC, 2014). Knowledge brokers are able to integrate the needs and interests of both scientists and decision makers by facilitating relationships between scientists and decision makers (see Box 1, for example, from Kenya). Therefore, knowledge brokers directly or indirectly influence credibility, salience, and legitimacy, the core characteristics of the CCVA. Effective knowledge brokers remain engaged with scientists and decision makers throughout the uptake process.

Champions may include development planners, donors, or politicians, among others. Champions are similar to knowledge brokers but they do not usually possess high levels of technical capacity to provide input into the CCVAs. Instead, champions focus their efforts in communicating findings from the CCVA in the decision-making phase of the uptake process. They play a greater advocacy role compared to knowledge brokers and are influential in the government arena in order to shape policy (ARCC, 2014). Champions may stay throughout the uptake process and recruit other champions along the way. They help sustain linking CCVA findings to plans and policies from the implementation to the decision-making phases.

BOX 1: THE ROLE OF KNOWLEDGE BROKERS IN NORTHERN KENYA

The Kenyan Climate Adaptation Fund provides financial support to pastoralists in Northern Kenya to adapt to climate change. As a knowledge broker, the International Institute for Environment and Development (IIED) worked jointly with scientists conducting a CCVA to inform local climate planning and fund allocation to help pastoralists adapt to climate change. IIED also worked with NGOs in Northern Kenya to ensure that scientists were incorporating views of pastoralists. Scientists used different methods to collect information ranging from community resource mapping, focus group discussions, and forecast workshops. Downscaled climate projections were also integrated into the CCVA. IIED and its NGO partners helped scientists and pastoralists to work together to build credibility and the relevance of the CCVA to decision makers in Northern Kenya. Knowledge brokers played an important role in developing legitimacy since IIED and local NGOs ensured that the CCVA design supported strong participation of pastoralists. For instance, women's views were included in the CCVA to reduce male bias and increase women's participation.

IIED and NGOs in Northern Kenya played a critical facilitating role that led to consensus between pastoralists and government officials as to where funds should be allocated. The uptake process also helped prioritize adaptation needs for investment and fostered greater appreciation among government staff for the value of community knowledge and for the rationale behind pastoral management strategies. The CCVA built local people's capacity to understand the challenges faced by government staff. The CCVA has been used to inform decision making at ward- and county-level planning. It is included in the Kenyan National Adaptation Plan and County Livestock Strategy and is being used to streamline scaling-up adaptation activities in neighbouring counties. These achievements have been highlighted in Kenya's National Climate Change Strategy (see http://pubs.iied.org/17161IIED.html).

5.0 INFLUENTIAL FACTORS IN THE UPTAKE PROCESS

5.1 CONTEXTUAL FACTORS

CCVAs and the adaptation decision-making processes do not exist in a vacuum but within a specific context. The context is the reality or the situation beyond the realm of the CCVA implementer and user. Several contextual factors influence the development of the core characteristics and the uptake process. For instance, the socioeconomic or political context in which the CCVA is situated may determine the extent to which uptake takes place. A decision maker's interest to take part in the CCVA and the uptake process is contingent on the level of dependency of a population on a particular natural resource and economic health of a particular place. The level of transparency, public participation, legal framework, and "co-management institutions" can affect the relationship between scientists and decision makers (Kushner, Waite, Jungwiwattanaporn, and Burke., 2012). Additionally, availability of finances, planning and program cycles, organizational structure, and low organizational turnover within a body that supports the CCVA could influence how far the CCVA progresses in the uptake process (WRI Roundtable, 2014). Political feasibility and will, decision protocols, and timing of certain opportunities also influence if and how science translates into policy and planning (Moser and Ekstorm, 2010).

Participants from the ARCC 2014 workshop suggested that if national-level decision makers "mandate" or "incentivize" conducting a CCVA, then this demand becomes a driving or influential contextual factor behind the CCVA. In the case of Kenya (Box 1), the new constitution adopted a devolved system of governance that created incentives to conduct and implement a CCVA at the county level. A general lack of knowledge among development and adaptation planners about dryland ecology also created an incentive in Kenya to conduct the CCVA. In Uganda (Annex 1), USAID mandated a CCVA to inform USAID's program development in climate change.

5.2 COMMUNICATION

Communicating climate change information found in CCVAs is challenging for many reasons. In order to establish the core characteristics of the CCVA, scientists and decision makers who provide input to the CCVA need to communicate with each other. Internal communication between the scientists and decision makers is challenging since various actors in the uptake process differ in their levels of knowledge about climate change. This challenge also applies to communicating CCVA findings to a broader audience once the CCVA is completed. The context in which internal and external communication takes place also influences communication. For instance, culture of communicating can affect internal communications. Socio-political factors also influence external communications.

5.2.1 Ways Internal and External Communications Can Be Addressed

- Knowledge brokers reducing misunderstandings about climate change among the various actors involved in the uptake process, as they are able to facilitate communication between those from the scientific and decision-making worlds.

- Communication specialists communicating and disseminating packaged information to a targeted audience in a format that is easy to understand. External communications should convey stories of reality on the ground and high-level analysis of technical information to create greater relevance for decision makers and non-science audience to make changes (WRI Roundtable, 2014).
- Communicators being aware and sensitive to context when communicating internally and externally.

Communicating uncertainty in particular is challenging when presenting scientific information to decision makers. Uncertainty regarding climate change impacts, the complexity associated with climate vulnerability, and the lengthy time frame along which climate change will unfold can make information unclear (Dinshaw et al. 2012). This can also stall decision-making (ARCC, 2013b).

5.2.2 Ways Scientists and Decision Makers Can Address Climate Uncertainty

- Presenting and framing uncertain information in range format (ARCC, 2014; Nisbet, 2009). Scientists can communicate uncertainty by stating a range of confidence levels that a climate event will take place by using the terms "high" or "low." For example, there is "high or moderate confidence" that a drought will occur with changes in temperature between 1 and 1.5 degrees centigrade.
- Creating space to discuss uncertainty through multiple methods. For example, in addition to text in a CCVA, vulnerability maps could help audiences understand and grapple with uncertainty.

Usually, scientists communicate findings from CCVAs at the end of the CCVA study. However, those involved in a CCVA should communicate information about the CCVA continuously throughout the uptake process to increase awareness and to help engage stakeholders (Moser and Ekstrom, 2010). Knowledge brokers and champions also play an important role in communicating findings from the CCVA. Communication throughout the uptake process can help create greater "buy-in" and relevance to the CCVA to decision makers (ARCC, 2014). Those involved in the uptake process communicate CCVA findings using various methods (see Box 2).

BOX 2: CCVA COMMUNICATION METHODS

CCVA authors use a wide variety of communication strategies and methods to communicate CCVA findings for uptake. One strategy is to use written communication. Written documents are relatively easy to share through either a print or an electronic copy (they are also easy to put aside or delete). The content and the length of the written document can differ by audience. For instance, in the case of Kenya (Box 1), IIED published the CCVA in full with the National Drought Management Authority for those interested in a detailed CCVA. A separate policy version of the CCVA in Kenya was produced targeting policy makers. In Uganda (Annex 1), executive summaries were produced and published to target policy makers and district level decision makers who may not have the time to read a large CCVA document. Those who conducted the CCVA in Uganda developed district-level scenarios for district-level stakeholders to improve their understanding of local vulnerability.

Another communication strategy is to use public outreach to communicate CCVA findings. The benefit of using public outreach methods is that it allows space for interaction and dialogue. In Kenya (Annex 1), for instance, community radio was used for public engagement and a DVD was produced to present the project from local perspectives. The DVD was disseminated to national policymakers, and county government staff.

6.0 SUMMARY OF LESSONS LEARNED

The uptake process is complex and differs from place to place depending on the types of actors involved in the process and the influential factors in place. Despite different uptake experiences, we end this paper by highlighting some of the common lessons learned on integrating CCVAs into decision-making processes.

6.1 LESSONS LEARNED ON CONNECTING SCIENCE TO DECISION MAKING THROUGH CCVAS

- **Establish core characteristics for an uptake-ready CCVA by developing credibility, salience, and legitimacy.** Interaction and debate between scientists and decision makers helps establish credibility of the CCVA. Establishing credibility is important in order to ensure that the CCVA is accurate and contains high-quality technical information. Participation and discussions between scientists and decision makers makes the CCVA salient to decision makers to inform policies and programs. The CCVA process maintains legitimacy when different perspectives are incorporated openly and appropriately. Legitimate participation leads to increase relevance of the CCVA.
- **Engage critical actors to develop an uptake-ready CCVA and integrate CCVA findings into plans and policies.** Engagement between scientists and decision makers in the design, implementation, and decision-making phase of the uptake process is critical to establishing the core characteristics of the CCVA. Knowledge brokers are important in creating a bridge between science and decision-making. Champions are important in advocacy and disseminating information about CCVA findings to inform decision makers.
- **Communicate CCVA findings in a clear manner to keep the CCVA relevant and accessible to decision makers.** Targeting information and using clear and appropriate language to tailor messages to specific audiences not only leads to greater awareness of the importance of a CCVA, but also increases the relevance of the CCVA at multiple scales.
- **Be aware of the context in which the CCVA is being conducted and the decision making context.** The socioeconomic or political context in which the CCVA is situated affects the ability of scientists and decision makers to work together. Contextual factors, such as dependency of a population on a particular natural resource, economic health of a particular place, level of public participation, political feasibility, finances, and decision protocols influence if and how science is translated into policy and planning.

ANNEX 1: EXAMPLES OF UPTAKE PROCESSES FROM UGANDA AND VIETNAM

IMPLEMENTING A CCVA IN UGANDA TO INFORM PROGRAM DESIGN

ARCC, in partnership with Ugandan research institutes and government agencies, conducted a CCVA to inform USAID's Feed the Future program to develop a climate change component in Uganda. The objective of the CCVA was to assess the impact of projected changes in climate on agricultural value chains and the livelihoods of people who depend on them. Scientists addressed credibility of the CCVA by using several research methods to collect information. These methods included mapping climate sensitivity, conducting livelihoods surveys, phenology studies, and value chain analysis of crops. CCVA implementers presented the CCVA findings to national- and district-level decision makers to validate and enrich the CCVA findings to build a credible CCVA. Incorporating multiple perspectives also led the CCVA to become relevant among national- and district-level decision makers since they were included in the CCVA development process. The CCVA became highly relevant to donors who were beginning to design interventions to promote adaptation activities. Policy makers used the CCVA to develop the Uganda National Climate Change Policy and Adaptation Strategy, as well as district-level Guidelines for Mainstreaming Climate Change into District Development Planning and Budgeting (Source: ARCC, 2014)

SHARED LEARNING IN VIETNAM

The Institute for Social and Environmental Transition (ISET) in Vietnam conducted a CCVA to help decision makers design adaptation resilience plans for Hue city. Scientists encouraged shared learning among decision makers that included city dwellers, urban planners, and government officials. The process of merging different perspectives from a range of decision makers led the CCVA to be credible in the eyes of the stakeholders. Scientists built relevance of the CCVA among communities of city dwellers by including local knowledge and their perspective on urban planning. Urban planners also found the CCVA relevant since the CCVA included their input on spatial planning. The participation of community members, city planners, and government officials created a legitimate process to develop the CCVA for Hue. This process is slowly helping decision making evolve from a technocratic approach to planning based on iteration and shared learning. Decision makers have integrated the CCVA into several plans, such as the climate resilience and disaster risk reduction plan, urban master plan, socio-economic development plan, and sectoral plans (Source: ARCC, 2014).

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