Education for disaster risk reduction toward change: The case of the ‘Climate Change Academy’ in Albay province, Philippines*

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Abstract

The increasing frequency of disaster risks due to natural hazards such as typhoons that hit the Philippines over the past years has become a major concern of disaster risk reduction managers especially in the Province of Albay – a typhoon highway of the country. Local and national legislations have begun to address this issue by means of capacitating the local government units (LGUs) so that communities can prepare, respond and recover (better) from the impact of disasters. The purpose of this paper is to examine the contribution of the government-led education program through the ‘Climate Change Adaptation and Disaster Risk Reduction and Management Training Institute’, most commonly known as the ‘Climate Change Academy’, to the overall disaster risk reduction processes for community resilience building in Albay. To be able to substantiate the Academy’s contribution, this paper used the socio-ecological model of change and organizational behavior concept to evaluate the factors that contribute to behavioral changes of the staff of LGUs who underwent the training as well as changes in their workplace policies and practices as a result of the training program. Following this, these changes were explained further by looking at how the concept of education for disaster risk reduction (EDRR) was carried out in the Academy’s training program in order to help achieve the desired results in terms of building the capacities of the LGUs. For this paper, data was collected mainly through a tracer study of 11 former participants of a particular training activity and in-depth interviews with different individuals who are directly or indirectly related to the Academy. It was argued in this paper that capacities and skills were built and that positive changes in the participants’ behavior were observed after undergoing the training in the Academy and that these changes have been helpful in reducing disaster risks in their respective communities, which in effect contributed to the community resilience building effort of the Province of Albay.

Keywords: education, disaster risk reduction, behavior change, Albay, Philippines

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**Chairperson, Kabataan Kontra Kahirapan (Youth Against Poverty – Philippines)
Introduction

Considered as the typhoon highway of the Philippines, the Province of Albay has been identified as one of the most vulnerable to disasters provinces in the country according to a study released jointly by the Department of Environment and Natural Resources (DENR) and the Manila Observatory (Center for Environmental Geomatics – Manila Observatory 2005). Disaster risks and vulnerabilities of Albay includes climate weather related risks such as typhoon, rainfall increase, El Niño, and temperature increase, and geophysical hazards such as earthquake induced landslides, earthquakes, tsunami, and volcanic eruptions (Salceda 2012).

Without much of a debate, education creates a positive effect on reducing risks and vulnerabilities of peoples and communities (Asia-Pacific Cultural Centre for UNESCO (ACCU) 2011; Fazey et al. 2007; Huckle and Sterling 1996; Nathe 2000; Polotan-dela Cruz and Ferrer 2010; UNESCO 2005; UNISDR 2005). At the global level, it is regarded as a key feature in disaster risk reduction and management (DRRM) as articulated in the Hyogo Framework for Action (HFA 2005-2015), a blueprint agreed by 168 national governments in 2005 to catalyze and institutionalize a process to establish the culture of safety and resilience in and among nations and communities (UNISDR 2005). UNESCO explained that the role of education for disaster risk reduction (EDRR) is to ‘develop a resilient population that is able to reduce the economic, social, and cultural impacts should a hazardous event occur,’ and ‘save lives and prevent injuries should a hazard occur’ (UNESCO Website). The United Nations Millennium Development Goals (MDGs), when applied in the Hyogo Framework, builds a stronger foundation for disaster risk reduction and resilience building.

Purpose and Objectives of the Study

To be able to understand the contribution of education in the overall disaster risk reduction strategy in Albay, this paper will look into the case of the training programs done by the Climate Change Adaptation and Disaster Risk Reduction and Management Training Institute (CCADRRMTI), commonly known as the Climate Change Academy. This paper will particularly address the following objectives:

- Determine the capacities gained by the participants as a result of the Academy’s training program,
- Determine the positive changes in the participants’ behavior as a result of the training program.

Conceptual Framework

This paper used the socio-ecological model of change to explain how changes in behavior of the individuals trained by the Academy are influenced by crosscutting factors on information

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1 Another role of EDRR as pointed out by UNESCO is to prevent interruptions to the provision of education, or ensure its swift resumption in the event of interruption.

2 For this paper, ‘Climate Change Academy’ or the ‘Academy’ will be used instead of the new name of the institution.
and knowledge, motivation, ability to act, and social norms that are manifested from the social environment to human action (Figure 1). The social structures that are in place that implement and contribute to the education program for disaster risk reduction in Albay will be taken in consideration so that necessary conditions in identifying opportunities and obstacles in maximizing impact of the Academy’s objectives is contextualized. As described in Figure 1, the enabling environment where institutional policies and practices are located as well as the type of leadership/s that are mandated to implement educational programs such as that of the Climate Change Academy will be analyzed as necessary factors needed to create behavioral changes.

It is also necessary to include the organizational behavior concept in order to analyse how the interactions between the individuals and the organizations or institutions influence the making of the desired human behavior and workplace policy changes in the organizational setting (Moorhead and Griffin 1995). The political dynamics in the government, in the case of Albay, for example, can be strong determinants for personal behavior and policy changes and can therefore affect the effectiveness of programs both in the community and provincial levels.

While disaster studies have already established the importance of education in DRRM, there are still limited researches that specifically identify the changes that have occurred both in the behavior of the individuals being trained and in the workplace as a direct result of the training and education provided by an institution.

**Figure 1** The Socio-Ecological Model of Change

Source: Agrawal, Aruldas, and Khan 2014, 6
Methodology

This paper used the case study approach, particularly employing the tracer study method to gather feedback from 11 select individuals who participated in the trainings of the Academy. These individuals are either members of the Sangguniang Barangay (SB or Village Council) or employees of the Provincial Government of Albay (PGA) – both belonging to the local government unit (LGU) of the province (refer to Table 1). The technique used in selecting the participants or informants of the study is purposive sampling technique. The sampling was based on a set of criteria that determines the relevance/irrelevance of learning to his or her functions in work both at the time of and after the training. The training selected for the tracer study is the ‘Disaster Risk Reduction and Climate Change Adaptation Training’\textsuperscript{3}. A participants list was provided by the Academy and was used as the main source of the sample. Fifty-two individuals representing the Albay Province were identified in the full list of participants in which the purposive sampling technique was applied. In circumstances that contact details provided in the list were unreachable, a referral system or snowballing technique was used.

<table>
<thead>
<tr>
<th>Informant No.</th>
<th>Training Year</th>
<th>Organization/Workplace During Training Year</th>
<th>Position During Training Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGA1</td>
<td>2012</td>
<td>Provincial Government of Albay (PGA)</td>
<td>Local Government Operations Officer II</td>
</tr>
<tr>
<td>SB2</td>
<td>2012</td>
<td>Village Council or Sangguniang Barangay (SB)\textsuperscript{4}</td>
<td>Barangay Councilor</td>
</tr>
<tr>
<td>PGA3</td>
<td>2011</td>
<td>PGA</td>
<td>Assistant Chief of Office</td>
</tr>
<tr>
<td>PGA4</td>
<td>2013</td>
<td>PGA</td>
<td>Researcher</td>
</tr>
<tr>
<td>PGA5</td>
<td>2013</td>
<td>PGA</td>
<td>Project Development Officer II</td>
</tr>
<tr>
<td>SB6</td>
<td>2012</td>
<td>SB</td>
<td>Barangay Councilor</td>
</tr>
<tr>
<td>SB7</td>
<td>2012</td>
<td>SB and City League of Barangays</td>
<td>Barangay Treasurer and League Staff</td>
</tr>
<tr>
<td>SB8</td>
<td>2012</td>
<td>SB and City League of Barangays</td>
<td>Barangay Captain and League President</td>
</tr>
<tr>
<td>PGA9</td>
<td>2012</td>
<td>PGA</td>
<td>Admin Aide IV</td>
</tr>
<tr>
<td>PGA10</td>
<td>2012</td>
<td>PGA</td>
<td>Admin Aide IV</td>
</tr>
<tr>
<td>PGA11</td>
<td>2013</td>
<td>PGA</td>
<td>Supply Officer</td>
</tr>
</tbody>
</table>

\textsuperscript{3} Three respondents however were selected from similar trainings that were done in 2011 and 2013 to include staff-participants from the Academy itself and two from the PGA and to cover in the analysis the political transitions that happened within the Academy and the local elections in 2013.

\textsuperscript{4} The Village Council locally known as the Sangguniang Barangay is the smallest governing unit under the Local Government Unit (LGUs) of the provinces in the Philippines. Council members are elected by registered voters in the community once in every three years.

วารสารสังคมศาสตร์ คณะรัฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
In depth interviews with the Academy’s officials and staff, and some of its partners who are directly and indirectly involved in the training program were also done to support the data collection process. Finally, a secondary data review provided relevant information in determining the current status of the DRRM in the province and the Academy’s guiding principles and strategies in carrying out its training and capacity-building programs for the LGUs and other stakeholders.

Structure

This paper is structured as follows. An introduction to this paper will be discussed in Section 1. Section 2 will discuss the basic profile of Albay Province which include its disaster risk reduction (DRR) strategies that respond to climate related risks and vulnerabilities to hazards. Section 3 will briefly discuss about the Academy and its training programs to give a background to its education principles and strategies in order to gauge their contribution in achieving disaster risk reduction in the province. In Section 4, the whole discussion about the capacities that have been built among the participants of the training will be determined and eventually be analyzed whether the lessons learnt have resulted into changes in personal behavior change. Finally, Section 5 will summarize the findings of this paper and pose some recommendations that can be made useful for the Academy’s future program planning and implementation.

The Albay Model: ‘Safe and Shared Development’

Profile of Albay: Social and Environmental Vulnerabilities

As briefly discussed in the introduction section, Albay is home to various disaster risks and vulnerabilities. This condition necessarily worsens the poverty situation of the people of Albay.

Bounded on the east by the Pacific Ocean, on the northwest by the Lagonoy Gulf and on the west and southwest by Burias Pass, it is no wonder Albay is prone to climate related disasters with 3-5 major typhoons that hit every year resulting to mudflows, storm surges, flooding, and landslide. Situated also along the Pacific Ring of Fire, it has a very high risk of exposure to volcanic eruptions due to Mount Mayon’s active volcanic activities that may threaten the communities of three cities and municipalities of Albay. Because of its geographic location, tsunamis are a huge threat to the people as Albay, with a population of 1.2 million (2010 Census), is surrounded by 364-kilometre long coastlines that can affect around 300,000 people.

Not only that Albay has high environmental vulnerabilities to disasters, it is also challenged by persistent poverty. According to the official statistics, poverty incidence among families in Albay has increased from 30.2% in 2009 to 33.9% in 2012. This provincial figure,
which is way above the national average of 19.7%, has not been changed that much since 2006 when poverty incidence was at 28.7%. At a national scale, Bicol (Region V) where Albay is located is among the poorest regions in the Philippines (National Statistical Coordination Board (NSCB) 2013). The constant threat and destruction of disasters to the source of livelihoods of a large portion of the Albay, a population which are mainly based on agriculture, fisheries and ecotourism, plays a huge factor in poverty situation in the province. This condition traps the poor population in a cycle of (increased) poverty and disaster (Oxfam GB 2013). Figures 2 and 3 visually describes disaster and poverty situation in Albay:

Figure 2 Combined Risks to Climate Disasters  
Figure 3 Poverty in the Philippines

Sources: National Statistical Coordination Board (NSCB) 2013; Salceda 2012

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5 Poverty as a social indicator is defined by the Philippine government as the condition in which the basic food and non-food needs are not being met by an individual or a family. Income of a household/family (with 4-5 members) which falls below the national average of USD 183 (PhP 7,890) or less than USD 1.25 per day per person is categorised as poor.
The vulnerability to disasters experienced regularly by the local people of Albay, especially the poor, clearly captured the social justice issue where ‘those who have less in life, have more in risks’ (Salceda 2012). This fundamental basis of disaster risk reduction and management initiatives in Albay currently led by Governor Joey Sarte Salceda reinforces what previous studies have underscored that the idea of reduction of human vulnerabilities created by poverty is a central element in DRRM paradigm (Intergovernmental Panel on Climate Change 2012; Wisner, Blaikie, Cannon, and Davis 2004; World Bank 2005) where education and skills training is a crucial component.

Adaptation Strategy of Albay: Innovation in Disaster Risk Reduction

Albay has established the Albay Public Safety and Emergency Management Office (APSEMO) in 1994, which serves as the permanent mechanism for preparing and responding to various types of hazards and disasters. This innovation in disaster management was later followed by the institutionalization of the Centre for Initiatives and Research for Climate Adaptation (CIRCA) in 2008 and the Albay Millennium Development Goals Office (AMDGO) in 2009. To specifically respond to the growing needs to provide training and education for the LGUs, the Climate Change Academy was created in 2011. These four institutions with interlinked objectives and roles facilitate disaster risk reduction and management as well as the climate change adaptation programs in Albay. The combined efforts of these institutions contribute to programs that will initiate sustainable economic growth especially in poverty and disaster stricken communities. This strategy makes up Albay as a model LGU.

Due to the recurring cycle of disasters and socio-economic deprivation in Albay, the leadership of Salceda, who were elected in 2007, further introduced innovative approaches to addressing these issues by integrating these strategies in the development planning and implementation processes. These strategies, which make up the Albay Model, are the following:

- Localization of Millennium Development Goals (MDGs) and as a goal for DRR;
- Establishment of environmental and socio-economically sound policies with appropriate budget allocation for DRR and development projects;
- Execution of programs and projects from the provincial level down to the communities;
- Building institutions for social service delivery, research and development, and capacity building; and
- Nurturing partnerships and resource mobilization. (Salceda 2012)

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6 The AMDGO is the reorganised form of Ayuda Albay formed in 2007 to manage the cluster approach to rehabilitation post 2006 disaster (Salceda 2011).

7 Before being elected as Governor of Albay, Salceda served as a Member of the Philippine House of Representatives (Congress) from 1998 to 2007. He also had a short stint in 2007 as Malacañang Chief of Staff under the Office of the President Gloria Macapagal-Arroyo.
The ‘Albay Model’ reinforced the ‘Zero Casualty’ policy during disasters and institutionalized ‘safe and shared development’ paradigm which encapsulates goals on climate and disaster proofing and improved human development index (HDI) as necessary conditions to development. In effect, this strategy resonates with the human security approach to development defined by the UNDP in 1994 where environmental security is set as crucial principle in protecting people from the onslaught of natural hazards and human-induced disasters. As argued by Bohle, Etzold, and Keck (2009) and Obrist, Pfeiffer, and Henley (2010), resilience is a dynamic process linked to human agency where groups and people are able to deal with hazards, adapt, cope, learn, and innovate, and to develop leadership capacity arising from the onslaught of disasters.

All programs that are envisaged in the Albay Model are located in the DRRM continuum: pre-disaster phase (risk reduction and preparedness), disaster phase (response), and post-disaster phase (early recovery, rehabilitation and reconstruction).

The triple typhoons in 2006 (Milenyo in September, Reming in November, and Seniang in December) which triggered the collapse of volcanic debris deposited on the slope of the Mayon Volcano left more than 600 dead and 400 more missing, and billions of pesos worth of destruction to infrastructure and agriculture in Albay (Salceda 2012). This 2006 disaster was considered as a painful reminder for Albay to strengthen even more its DRRM programs especially in the enforcement of the ‘Zero Casualty’ policy. The Provincial Disaster Risk Reduction and Management Council (PDRRMC), which oversees the overall DRR programs, are operationalized under the following guiding principles led by its governor since 2007:

- To promote a proactive and not a reactive response to disasters;
- To evacuate at the early stage of the calamity instead of to rescue affected families;
- To promote an institutional rather than personal orientation;
- To promote coordination and teamwork and not individual action;
- To conduct community-based disaster risk reduction programs and projects as basic input to the Regional Master Plan;
- To adopt a disaster proofing approach to development; and
- To integrate DRR in the Comprehensive Land Use Plan and promote no or selective investment in high-risk zone, maximum protection in the low to moderate risk zone, and to identify safe zones as sites for new development investments. (Espinas 2013)

This set of guidelines is the basis of the training and education programs of the province under the auspices of both APSEMO and the Academy which puts premium on the three elements that will achieve the ‘Zero Casualty’ policy: 1) early warning systems, 2) communication protocol, and 3) evacuation procedures.

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8 Foreign exchange rate is approximately 1 USD = 44.5 PhP as of 10 November 2014.
Since Typhoon Reming in 2006, Albay has been successful in maintaining the ‘Zero Casualty’ goal except in 2011 when another strong typhoon hit the Bicol region, which left Albay with 77 deaths and more than PhP 4-billion damage to infrastructure and agriculture. It should be noted also that from 1994 since the establishment of APSEMO to 2005, no casualty was recorded from climate and volcanic related hazards that affected the province during that period (Salceda 2012).

**Model for National Laws**

Because of Albay’s effective strategy on building institutions and successful implementation of its DRRM programs, the province was declared as a role model of the United Nations International Strategy for Disaster Risk Reduction (UNISDR) for Institutionalized and Innovative Disaster Risk Management in 2008.

Following this, two national laws on DRR and CCA were based on the Albay Model (Salceda 2012). The Republic Act (RA) 9729 or ‘The Climate Change Commission Law of 2009’ and the RA 10121 or the ‘The Philippine DRRM Act of 2010’ are the laws that mandate the institutionalization of a DRRM Office (aside from the DRRM Council) and the Climate Change Commission, respectively. Prior to the passing of these laws, Albay was able to organize two national conferences on climate change, which produced the “Albay 2007 Declarations” and the “Manila 2009 Declarations”. The former has become a tool for the early passage of the Climate Change Act and the creation of the Climate Change Commission which is the sole national-level policy-making body tasked to coordinate, monitor and evaluate the programs and action plans of the government relating to climate change (UNISDR website). The deadly typhoons that hit the Philippines in 2008, 2009 and most especially in 2010 which exposed the weak disaster management in the country, legislators were pushed to accelerate the passing of the DRRM Law.

Albay Governor Joey Salceda who is known in the country as the ‘green economist’ and a champion of CCA and DRR institutionalized CIRCA in 2009 which provides technical support on research and development to APSEMO about climate change adaptation strategies and is currently co-managing the Academy.

**The Climate Change Academy:**

**An Innovation for Disaster Risk Reduction**

**Institutional Profile**

Being a model in DRR and CCA and consequently because of the passage of the CCA Law, the Climate Change Academy for the

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9 Republic Act (RA) 9729 or the “Climate Change Act of 2009” is a law that aims to mainstream the concept of climate change into government policies, establish a framework strategy and programs on climate change, and create a Climate Change Commission that will address the vulnerabilities of the Philippines and its people.

10 Republic Act (RA) 10121 or the “Philippine Disaster Risk Reduction and Management Act of 2010” is a law that institutionalises the strengthening of the country’s DRR and DRM system by providing a national framework, plan, and funds for its implementation from the local to national levels.
LGUs in the Philippines was established and inaugurated in 2011 in Albay under the auspices of CIRCA and APSEMO. It is the first institution in the country that provides education, research, training and public awareness programs pertaining to climate change adaptation and disaster risk reduction. It envisions for ‘a world-renowned Academy on CCA and DRR towards the development of empowered, socially-responsible and resilient communities’ (Daep 2014).

The Academy was created upon the initiatives of different government and private institutions such as the Provincial Government of Albay (PGA), the Bicol University, UN System, Agencia Española de Cooperacion Internacional para el Desarollo (AECID), the Office of the President, Climate Change Commission, University of the Philippines Los Baños (UPLB), International Centre for Agroforestry, CLIM System Limited, University of Sunshine Coast - Australia, and various national government agencies such as the Department of Science and Technology, Department of Environment and Natural Resources, Department of National Defense through the Office of Civil Defense (OCD), Department of Interior and Local Government, and the Department of Agriculture (Climate Change Academy, Undated).

Apart from the CCA Law, the active engagement of the Province of Albay through the leadership of Governor Salceda (even long before he was elected in this position) has established a well-grounded framework and legal basis of the Academy arising from local and international agreements such as the UN Framework Convention on Climate Change (UNFCC), 2007 Albay Declaration on Climate Change Adaptation, 2009 Manila Declaration, Memorandum of Understanding (MOU) with the Office of the President-Climate Change Commission and the UN Systems for the Establishment of the Academy, and the Memorandum of Agreement between the PGA and OCD designating the Academy as one of the DRRM Training Institute of the National Disaster Risk Reduction and Management Council (NDRRMC) (Climate Change Academy, Undated).

Hosted by its partner the Bicol University, the Academy’s training programs that are designed for executive positions in LGUs around the country as well as public officials down to the village level have the overall learning goals as follows:

- Orient participants on how climate system works, with focus on large-scale features and processes that are relevant to social and individual decision-making;
- Provide a general overview of the dynamics of the environment with society and how such interaction can be modified and managed with the use of modern climate information;
- Introduce intervention techniques for climate change adaptation initiatives relevant to their context or areas of concern, and;
- Introduce plans on disaster risk reduction and management relevant to their context or areas of concern. (Climate Change Academy, Undated)
In order to achieve the set vision and goals of the Academy, Figure 4 describes the logical framework where education and training is among the four final outputs.

**Figure 4 Climate Change Academy Logical Framework**

Source: Daep 2014

Despite being young in its program implementation, the Academy has been serving other LGUs by means of providing education and training and technical inputs to their DRRM plans. These engagements fall under the Education and Training, and the Extension Services and Advocacy programs.

Because of its close working relationship with the OCD and APSEMO especially in the pre-disaster phase of the DRRM continuum, the Academy has now been renamed as the Climate Change Adaptation and Disaster Risk Reduction and Management Training Institute (CCADRRMTI). This action is considered to further institutionalize the functions of the Academy as a training ground for LGUs (GE1 Interview, 3 July 2014). While the OCD serves as the Secretariat of the Provincial DRRM Council (PDRRMC), APSEMO acts as the permanent disaster risk management office (DRMO) in Albay. The Memorandum of Agreement signed by the OCD and the Provincial Government of Albay (PGA) in March 2014 officially launched the country’s first training institution, combining the Climate Change Academy and the APSEMO. According to the governor, this transition ‘further elevated the legal and technical status of the Academy… and is designated as a training institute of OCD and the NDRRMC, under RA 10121, for Southern Tagalog (Luzon), Bicol and the Visayas’ (Salceda 2014).
The Training Course: Education for Disaster Risk Reduction

The specific training course that will be analyzed in this paper is the ‘Disaster Risk Reduction and Management and Climate Change Adaptation Training’, which was organized in seven batches from mid-2012 to early 2013 in Albay. The four-day certificate training course was envisaged to provide professional and technical training and education for managers and professionals working in national government agencies, LGUs including the village councils (Sangguniang Barangay), and non-governmental organizations (NGOs) who have a track record in working with LGUs in Southern Luzon including Bicol and the Visayas – all of which are identified as highly vulnerable to disasters (Center for Environmental Geomatics - Manila Observatory 2005).

Course Content, Design and Pedagogy

The content of the course is divided into themes per day which are: 1) Understanding Disaster Risk; 2) Approaches, Principles and Laws in DRR and CCA; 3) Engaging Stakeholders; and 4) Ways forward and Field Visit. Participatory training methods were used such as interactive lectures, case presentations, group dynamics and workshops, individual reflections and exercises, and scenario building and simulations. These mixed approaches of the Academy training program emphasized the role of the mentor as merely an enabler and a starter of the thinking process (Climate Change Academy, Undated). This clearly supports what Kelman, Mercer, and Karlsson (2014) argued that:

‘Education should not be a one-way, but instead should be about education through cooperation, so that people can set and create their own pathways by combining their own knowledge and concerns with those being brought in from outside.’ (Kelman, Mercer, and Karlsson 2014, 97)

According to the informants of the Tracer Study, the top three most effective methods/approaches used in the training are the following (order according to preference): 1) workshop/group work/brainstorming; 2) lecture and PowerPoint presentations; and 3) field exposure/visits. The training design itself fosters the importance of learning exchanges between the academe (science/theory) and the communities (practice) themselves by bringing together resource speakers from both fields of practice in DRR. The participants were able to locate the lessons learned from the training in everyday life through a field exposure that was organized at the last day of the training which was dedicated to field exposure attempts to bring the lessons closer to reality.

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11 Participants who completed the training will be given a certificate from the Academy which is a 3-unit credit in a post graduate program on MA in Public Administration major in Emergency Health and Disaster Management being offered in Bicol University Graduate School.
The pedagogical approach used by the Academy is the ‘Albay as a natural laboratory’ (Daep 2014; Salceda 2012) where past disaster experiences of the province are put into use. As Bicol University’s basic premise in building partnership with the Academy, the LGUs as the ‘first on the ground’ in all phased in the DRRM continuum is a crucial element in providing ‘education to build resilient communities’. That is why it is important for the Academy to involve the LGUs from different cities/municipalities especially the Sangguniang Barangay (SB) officials to participate in trainings.

**Impact of the Academy: From lessons learned to behavior change?**

**Gained Capacities on Knowledge and Skills**

The results of the Tracer Study show that the knowledge and skills gained from the training have contributed to the overall DRR strategy of Albay as shown in Tables 1 and 2.

**Table 1** Results of Tracer Study on Knowledge Gained

<table>
<thead>
<tr>
<th>Knowledge Gained</th>
<th>Frequency of Knowledge Mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard and risk awareness</td>
<td>11</td>
</tr>
<tr>
<td>Contingency planning</td>
<td>10</td>
</tr>
<tr>
<td>Hazard and resource mapping</td>
<td>10</td>
</tr>
<tr>
<td>Concepts and terms on DRR and CCA</td>
<td>9</td>
</tr>
<tr>
<td>Capability and vulnerability assessment</td>
<td>7</td>
</tr>
<tr>
<td>Planning and budgeting</td>
<td>4</td>
</tr>
<tr>
<td>Early warning system</td>
<td>3</td>
</tr>
<tr>
<td>Alternative livelihood</td>
<td>2</td>
</tr>
<tr>
<td>Response and rehabilitation process</td>
<td>2</td>
</tr>
<tr>
<td>Environmental protection</td>
<td>1</td>
</tr>
<tr>
<td>Energy conservation</td>
<td>1</td>
</tr>
<tr>
<td>Gender in DRR</td>
<td>1</td>
</tr>
<tr>
<td>Networking</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Summary of results of Tracer Study questionnaire and interviews.
Table 2 Results of Tracer Study on Skills Learned

<table>
<thead>
<tr>
<th>Skills Learned</th>
<th>Frequency of Skills Mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk communication</td>
<td>9</td>
</tr>
<tr>
<td>Survival</td>
<td>9</td>
</tr>
<tr>
<td>Decision making</td>
<td>9</td>
</tr>
<tr>
<td>Leadership</td>
<td>8</td>
</tr>
<tr>
<td>Identification of alternative livelihoods</td>
<td>8</td>
</tr>
<tr>
<td>Critical thinking</td>
<td>7</td>
</tr>
<tr>
<td>Organizational development and management</td>
<td>7</td>
</tr>
<tr>
<td>Capability and vulnerability assessment</td>
<td>6</td>
</tr>
<tr>
<td>Hazard and risk mapping</td>
<td>4</td>
</tr>
<tr>
<td>Contingency planning</td>
<td>3</td>
</tr>
<tr>
<td>Planning and budgeting</td>
<td>4</td>
</tr>
<tr>
<td>Early warning system</td>
<td>1</td>
</tr>
<tr>
<td>Adaptation</td>
<td>1</td>
</tr>
<tr>
<td>Barangay/village engagement</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Summary of results of Tracer Study questionnaire and interviews

The development of capacities on critical thinking, problem solving and other social and emotional skills that is essential in people’s survival in times of disasters (Lopez-Carresi, Fordham, Wisner, Kelman, and Gaillard 2014) has been manifested by the results of the Tracer Study. The skills and knowledge outlined in Tables 1 and 2 are necessary capacities to undertake all actions required to successful DRRM program especially in terms of preparing the local people to the onslaught of any types of disaster risks. The informants of the Tracer Study who function as the first responder to disasters felt that the training enhanced their basic knowledge and skills in DRRM, taking into consideration the personal lessons learned from their experiences in previous disasters.

As the data suggest in Table 1, increased awareness on hazards, risks, vulnerability, and capability are the most learned knowledge from the training attended. Based from the power point presentation materials used for the training, multiple hazards such as typhoons, tsunami/storm surge, flooding, and lava/mud flow, among others, that pose risk to the province were used as examples to describe the concepts explained.
This set of learning is crucial as these four concepts define what disaster is in the context of Albay and that these inform policies and practice on how disaster risk reduction can be done in communities. For example, the case of the 2006 Typhoon Reming disaster was an unforgettable experience for the entire population of Albay because it showed how vulnerable the province is during extreme hazard events such as volcanic eruption followed by prolonged raining and typhoons.

It was noted in the Tracer Study interviews that the practicality of the content of the training modules especially in the workshop activities and the experiential approach to knowledge sharing as expressed by all the trainees interviewed strengthened the needed capacities through ‘learning by doing’ exercises. As Schank, Berman, and Macpherson (1999) argued regarding the experiential aspect of learning, the most important goal of the theory ‘learning by doing’ is to ‘foster skill development and learning of factual information in the context of how it will be used’. This has been manifested in the training design where lectures are combined with group work and workshops (e.g., hazard and vulnerability mapping). As one respondent shared, the experiential and practical approach used in the training made it easier for the participants to understand the rather technical topics in DRR and CCA. For example, in terms of practical survival tips in overcoming disaster risks, which were shared during the training, were notably remembered as an important knowledge in DRR, that is:

‘To be able to avoid damage to your house during a strong typhoon, we have to open a window where the wind is coming to avoid a vacuum that will cause too much pressure inside the house and lead to breaking of window panes.

One key example of the ‘learning by doing’ exercise is the demonstration of informants’ knowledge and skill on planning and budgeting. This skill set which are crucial components of the implementation of the DRRM Law is seen as an important learning for all SB officials. It was expressed by all the informants from the SB group that for them to be able to perform their duties in the BDRRMC (Barangay Disaster Risk Reduction and Management), they have to gain knowledge about concepts in DRRM (i.e., disaster risks and hazards, resources and capabilities, vulnerability) so that they can locate these in their own communities and consequently plan and appropriate budget for their plans through the calamity fund of the LGU’s internal revenue allotment (IRA). As a former barangay treasurer in Ligao City explained:

‘Dati, daeng sistema ki pag-release kan calamity fund kapag may minaabot na bagyo. Pagkatapos kaitung training kan Climate Change Academy sa paagi kang budget planning na piggibo mi duman, aram mi na kung paano gastuson ang budget kan samuyang barangay. (Before the training of the Climate Change Academy, there was no proper system in terms of the release of the calamity fund during typhoons. The training gave me the proper skills and knowledge in terms of proper budget appropriation and spending through the workshops that we did in the training.)’
As mandated by the DRRM Law, the allocation for the local DRRM fund (LDRRMF) should not be less than 5 per cent of the estimated revenue from regular sources (i.e. IRA) which 30 per cent for pre-disaster and 70 per cent for post-disaster activities should be appropriated and spent by the BDRRMC. In the provincial level, the DRRM and CCA programs which includes the ‘Zero Casualty’ policy of the province is being allocated 9 per cent of the annual budget (Salceda 2012).

This crucial learning from the point of view of the barangay official coming from a city that is vulnerable to flooding, landslide, and mudflow has been supported by another officer from a barangay in the Municipality of Malinao which has the same risks said:

‘Ngunyan aram mi na ang breakdown kan calamity fund iyu ini: 30% para sa Quick Response tapos 70% para sa prerasyon (Now we know that the calamity fund of the barangay should be allocated accordingly according to the 30% for quick response and 70% for preparations breakdown).’

Another key result that has been observed from the Tracer Study interviews is the integration of indigenous knowledge into ways of predicting hazards, which are usually explained by science. According to some of the informants, it was considered helpful for practical knowledge and skills enhancement especially in communities. Some of the examples that were shared in the study and interviews are the following:

- ‘Calm before the storm’ → ‘Area is in the eye of the storm’
- ‘When wild animals come down from Mayon Volcano, it is abnormal and will erupt soon’ → Emission of white steam plumes, rockfall events, edifice inflation from (January 2012) baseline are signs of increased volcanic activity
- ‘When ants start to build houses in higher places, there will be flooding’ → soil saturation

However, while all respondents felt that the training has provided knowledge and skills, all interviewed from the PGA except for one expressed that the impact of the training should also consider the already strong DRRM ‘training’ of the local people especially the government officials through regular occurrence of typhoons, for example. As one informant explained: ‘Luto na ang mga Albayanos kaya review na lang sainda ang training (The Albay people know about DRRM so the training is only a review to them)’]. The same informant however added that the repetition of knowledge reinforces skills and values that are crucial for successful DRR efforts. Another informant stressed that: ‘Even before the training of the Academy, I have attended the first batch of training on emergency paramedics for the Albay Health Emergency Management System (AHEMS) so I have a basic understanding about disasters and hazards, but
the training broadens my knowledge and skills’. The new capacities gained and the ones that were already learned prior to the Academy’s training program contribute altogether to the achievement of the ‘Zero Casualty’ goal.

‘Zero Casualty’ Goal as Center of Organizational Interaction

The anchor of the education for DRR (EDRR) programs in the Province of Albay as it appears in the Tracer Study interviews is the ‘Zero Casualty’ strategy. The merits of the policy in terms of protecting the lives of the local people are well regarded and followed by all the informants.

In the training program mentioned in Section 3.2, the content of the training module discussed about the various elements and procedures that can be done toward achieving ‘Zero Casualty’ goal. Early warning and evacuation are considered to be crucial elements for the policy. The fatal 2006 Mayon landslide was a strong justification to reinforce the ‘Zero Casualty’ policy and that it forced local people to act without much pressure from the government. ‘People don’t need to be told to evacuate because they follow the policy by heart and that they don’t want the 2006 tragedy to happen again in the future’.

The combined efforts of APSEMO and the Academy through its awareness-raising programs and the built sense of ownership of the people to the goal maintained the ‘Zero Casualty’ status of the Albay from 2012 to November 2014. The success of the Albay Model as demonstrated by the innovative policy on ‘Zero Casualty’ has been recognized by the people of Albay, especially the LGUs and has in fact received accolades from the Philippine President Benigno Aquino III when he cited Albay as a model in DRRM during his State of the Nation Address speech in July 2014, days after Typhoon Rammasun (Glenda) ravaged the province and the rest of the Bicol region.

Behavior Change: Disaster Preparedness

Given the lessons learned and the application of these in everyday life, disaster preparedness as a key behavior change among the 11 informants is an obvious outcome of the training program. Table 3 details the changes of behavior that were observed and their corresponding manifestations as expressed in the Tracer Study.
Table 3 Results of Tracer Study on Behavior Change

<table>
<thead>
<tr>
<th>Observed Changes</th>
<th>Frequency of Mention</th>
<th>Informants</th>
<th>Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sense of preparation</td>
<td>11</td>
<td>All</td>
<td>• Personal management in household during disasters</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Enhanced adaptive capacity during interruptions on basic services such as water, electricity, communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Risk mitigation regarding economic losses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Alertness to hazards especially typhoons (remembering Typhoon Reming disaster in 2006)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Community preparation through appropriate budgeting for DRRM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Adherence to ‘Zero Casualty’ Goal through awareness on evacuation protocols</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Enhance training on emergency paramedics</td>
</tr>
<tr>
<td>Confidence on role in the government or in the community</td>
<td>10</td>
<td>PGA1, SB2, PGA3, PGA4, PGA5, SB6, SB7, SB8, PGA9, PGA11</td>
<td>• Proper appropriation of budget on DRRM programs in the barangay</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Awareness on laws and policies on DRR and CCA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Awareness in role in DRRM especially on specific functions of Barangay Treasurer in planning and budgeting (procurement of calamity goods)</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Observed Changes</th>
<th>Frequency of Mention</th>
<th>Informants</th>
<th>Manifestations</th>
</tr>
</thead>
</table>
| Change in belief about disaster/s                     | 9                    | PGA1, SB2, PGA3, PGA4, PGA5, SB6, SB7, SB8, PGA9 | ● Avoidance to disasters can be done  
● Change from Filipino fatalistic trait as ‘bahala na’ (it is up to God) attitude  
● From reactive to proactive approach to disasters  
● From disaster as a way of life to culture of safety |
| Responsiveness to needs of the vulnerable and marginalized | 6                    | PGA1, SB2, PGA3, PGA5, PGA9, PGA11     | ● Integration of women-led livelihood projects in DRRM  
● Integration of ideas on climate resilient crops in agriculture programs for poverty reduction  
● Prioritization of women, children and elderly during evacuation procedures |
| Resilience                                            | 2                    | SB2, PGA5                              | ● Integration of women-led livelihood projects in DRRM  
● Integration of ideas on climate resilient crops in agriculture programs for poverty reduction |
| Concern to environment                                | 1                    | PGA3                                   | Energy conservation in household and workplace  
● Recycling |
| Motivation to learn and do more                       | 1                    | PGA3                                   | ● Contributed to producing information and education campaign materials on climate change with focus on adaptive agriculture  
● Writing a book on DRRM specifically on high risk zones of Albay |

Note: Summary of results of the Tracer Study and individual interviews
The results of the Tracer Study argued that ‘raising the awareness of the people on how their behavior is connected to policy outcomes that affect everyone, and teach them the alternative skills and behavior that lead to outcomes that policymakers intend’ (Weiss 2002, 217) is important in DRRM. This can be seen as how the ‘Zero Casualty’ goal of Albay as a policy and the personal experiences of the people on disasters facilitated behavior change among the informants.

Achieving the desired change in people’s behavior would require understanding of the array of attitudes and external factors that influence ordinary people (Monaghan 2012). Using the socio-ecological model of change, which explains the complex interplay of personal, cultural, and environmental factors that influence the desired behavior change according to cross-cutting factors of information, motivation, ability to act, and norms will attempt to describe the results of the Tracer Study (Table 4).

Table 4 Capacities Gained According to 4 Cross-cutting Factors in the Socio-Ecological Model of Change

<table>
<thead>
<tr>
<th>Factors</th>
<th>Capacities Gained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and Knowledge</td>
<td>• Hazard and risk awareness&lt;br&gt;• Contingency planning&lt;br&gt;• Hazard and resource mapping&lt;br&gt;• Concepts and terms on DRR and CCA&lt;br&gt;• Capability and vulnerability assessment&lt;br&gt;• Planning and budgeting&lt;br&gt;• Early warning system</td>
</tr>
<tr>
<td>Motivation (Attitudes and Beliefs)</td>
<td>• Change of beliefs in disasters: Can be mitigated and avoided&lt;br&gt;• Confidence on role in the government/DRRMC&lt;br&gt;• Resilience&lt;br&gt;• Needs of the vulnerable&lt;br&gt;• Sense of preparation&lt;br&gt;• Gender sensitivity&lt;br&gt;• Environmental concern&lt;br&gt;• Learning by doing</td>
</tr>
<tr>
<td>Factors</td>
<td>Capacities Gained</td>
</tr>
<tr>
<td>---------</td>
<td>------------------</td>
</tr>
</tbody>
</table>
| Ability to Act (Skills, Efficacy and Access) | ● Risk communication  
● Survival  
● Decision making  
● Leadership  
● Alternative livelihoods identification  
● Organizational development and management  
● Critical thinking  
● Capability and vulnerability assessment  
● Planning and budgeting  
● Early warning system  
● Hazard and risk mapping  
● Adaptation  
● Engagement with barangay |
| Norms (Perceived, organizational, socio-cultural) | ● Zero Casualty goal  
● Culture of safety  
● Indigenous knowledge  
● Learning by doing  
● Accountability of public officials in times of disasters  
● Competitiveness  
● Sense of recognition in DRRM |

Note: Summary of results of Tracer Study questionnaire and individual interviews

As presented in the table, it can be argued that capacities built according to the four cross-cutting factors in the matrix somehow are overlapping with each other as skills are linked with the knowledge gained, same way with norms, either perceived or organizational, as these relate to motivations of the individual within the system in which he/she interacts with (Claridad Tanvir 2014). This apparent cross-relationship can be further explained by what Brehm and Rahn (1997) argued that behavioral change toward a common goal depends on the positive association between the level of trust of individuals have for one another and the effective and favorable performance of governments in terms of accountability, flexibility, and innovation in policy making and the inclusion of stakeholders in planning processes (Fazey et al. 2007). Therefore, the personal experiences of people and DRRM policies in place define human agency toward disaster risk reduction.
In this case, the effective implementation of the Albay Model combined with the proven leadership of the Governor and the DRRM institutions that rally behind this serve as an enabling force toward desired behavior change. This in effect creates socio-cultural norms that encourage positive behavior change toward successful disaster risk reduction. These norms often point to how these are described by Governor Salceda (2012; 2014) as the ‘culture of safety in Albay’ in his public speeches and interviews and by the Academy and APSEMO chief who defined ‘DRR as a way of life’ (Daep 2008, 11). This philosophy has been standing to support the developmental and DRR targets of Albay.

**Conclusion**

The developmental framework of the Albay Model that guided the process of institutionalization of disaster risk reduction and management in Albay has shaped the quality of education and training programs and activities of the Climate Change Academy. The proven leadership of the local executives of DRRM institutions such as the APSEMO and CIRCA led by the governor influenced the impact made by the Academy in terms of building the capacities of the participants as demonstrated by the knowledge and skills observed in the Tracer Study. These capacities have been instrumental in the identified changes in the informants’ personal behavior, which are needed as they function in their respective communities and in their workplace. Further, these changes have also contributed to improving their personal management in their own households and communities regarding disaster preparation.

The interplay of different factors present in the society influenced the establishment or the strengthening of the desired changes as a result of the education-training program. The changes identified in the Tracer Study have been guided by the overall value system in the province that prioritizes the safety of the people during impending disasters. The ‘Zero Casualty’ strategy and the ‘safe and shared development’ which make up the Albay Model serve as the overarching principles of the province in defining the overall direction of the DRRM initiatives, particularly in building the capacities of people.

While the results of the study demonstrated positive behavioral changes, it would be necessary to expand this study in order to test these findings in a larger data sample and perhaps capture an even larger context that hopes to analyse the changes to other participants coming from other provinces.
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Intergovernmental Panel on Climate Change. 2012. *Managing the risks of extreme events and disasters to advance climate change adaptation: A special report of working groups I and II of the intergovernmental panel on climate change*. Cambridge, UK and New York, USA: Cambridge University Press.


