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Collective Action and Adaptive Capacity of Communities During Disasters: The Case of Oil Spill in Guimaras, Philippines

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ABSTRACT

Under conditions of limited time, resources, and attention, appraisal of responses to threats of industrial pollution presents formidable challenges for governance and disaster preparedness. A community's social dynamics could very well explain how the responses to such perturbations are made and what inherent traits of the household/community make them adaptive to disasters. Using both qualitative and quantitative approaches in research, this study looked at the collective action and adaptive capacity of communities affected by an oil spill. Questionnaire was fielded out to elicit data on communities' quantitative level of adaptive capacity and focus group discussions, in-depth interviews, observations, and narrative analysis were employed for qualitative data.

The oil spill experience reveals three forms of collectivity: actions through formal organizations, informal organizations and spontaneous actions -- all anchored on residents' varying motives, and intentions. Collective action when harnessed by personal agency results into desired trajectories thus strengthening communities' adaptive capacity.

A household adaptive capacity index (HACI) consisting of demographic structure, economic well-being, interconnectivity to higher level processes, and dependence on a resource-- as indicator of measuring adaptive capacity was devised and employed in selected communities affected by oil spill in Guimaras, Philippines. Ten percent or 88 households were randomly selected as survey respondents. In the outcome, the communities were fairly adaptable (with HACI of 55.43) to the perturbations. It was concluded that a strong social capital, high economic well-being, and less dependence on a single resource for livelihood made the household highly adaptable to environmental stresses.

Key words: *collective action; adaptive capacity; oil spill; Guimaras, Philippines*

INTRODUCTION

Why can some communities and households easily adjust to perturbations whereas others cannot? What traits in the former make them resilient during and after disasters? Do institutional and social variables play a role in the adaptive mechanisms of the households or communities?

The adaptive capacity concept stems from literature on disaster preparedness and management and has evolved in its application and use in recent years. The multi-dimensional phenomenon is determined by a number of incumbent factors, e.g., the inherent characteristics of the place and its exposure to hazards (*Romero-Lakao and Tribbia 2009*); its incorporation to or association with vulnerability, risks, resilience, sensitivity *(Adger et al. 2002; Brooks 2003; and Gallopin 2006*); or its response to change (*Carpenter et al. 200; and, Folke et al. 2003*). Interestingly though, scholars in many adaptive capacity literature distinctly tend to elaborate on and address natural disasters in their definitions (*Smit and Wandel 2006*). A few of them looked into man-made disasters (*Chand 2000*), specifically, industrial pollution and accidents plaguing some communities.

Another concept anent to adaptive capacity is the cultural influence on the collective efficacy of people's actions (*Paton and Tang 2008*) leading to a desired trajectory. Desired trajectory means decisions that are advanced and acted, leading to the households' or communities' eminent recovery from the disaster and may include lessons learned in the process (*Olsson 2003*). Does their collective behavior lead to effective results? What collective decisions were made in the course of action?

With the oil spill incident in August 2006 in Guimaras Province, Philippines as the case point, this study identified and analyzed the indicators of the communities' adaptive capacity; categorized and discussed the forms of collectivity identified in the course of the communities' response to the disaster; advanced and discussed the relationship between collective action and adaptive capacity; and inferred the role of personal agency and transformative capacity in the identified indicators of the communities' adaptive capacity.

The MT Solar 1 Spill in Guimaras

In the late afternoon of August 11, 2006, M/T Solar I, a vessel owned and operated by Sunshine Maritime and chartered by Petron, sank about 13.3 nautical miles southwest off the coast of the island province of Guimaras. It was on its way to Zamboanga from the port of Batangas. It was estimated to have sunk to a depth of 640 m in the Panay

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gulf area. The vessel was carrying a fuel cargo of 2.19 M liters or 97% of its carrying capacity of 2.24 M L. In terms of weight, the fuel cargo was 2,064 mt or 96% of the deadweight tonnage of the vessel. Conservative estimates revealed that it could be as low as 500,000 L to as high as 2 M L of fuel cargo that might have been accidentally spilled out to the strait. In both ecological and social terms, the disaster significantly affected the nearby ecosystem **(Table 1**). The Resources, Environment and Economic Center, Inc. (*REECS 2007*) pegged the cost of damage at PhP 9.22 B. This did not even include the compensatory damages in terms of livelihood costs (as of March 2008, the total compensation disbursed by OPCF totaled PhP 120.3 M).

Table 1. Effects and consequences of the cil spill incident in Guimaras (*NDCC, 2006*).

Affected families	7,870
Affected persons	39,004
Displaced families	71
Affected areas	• 2 provinces (Guimaras, Iloilo) • 7 municipalities (Nueva Valencia, Sibunag, San Lorenzo, Jordan, Buenavista in Guimaras; Ajuy and Concepcion in Iloilo) • 58 Barangays
Threatened areas	38 Municipalities (16 in Iloilo, 21 in Negros Occidental and 1 in Cebu)
Affected Ecosystems	• DENR Marine reserves (1,043.45 ha) • Coastline (234.84 km) • Coral reef (15.80 km^2) • Mangrove (478.48 ha) • Seaweeds (107 ha) • Fishponds (974 ha)

MATERIALS AND METHODS

The oil spill contaminated the body of water in the nearby communities, with the municipality of Nueva Valencia having been heavily affected. Three sites (communities) were studied, with Barangay Tando in Nueva Valencia at the forefront. The two other sites namely Barangays Sebario and Suclaran both in San Lorenzo town, Guimaras Province, were used to validate whatever significant findings the lead barangay revealed.

Collective action and adaptive capacity concepts have been the subjects of recent developmental and descriptive studies. A survey on the approaches used in collective action research reveals that because of its dynamic nature, collective action is difficult to measure and study (*Meinzen-Dick et al. 2004*). The variability of the kinds of research questions being sought is the sole and major basis for determining the approach utilized. In this study, both quantitative and qualitative data collection and analysis were used. In the same manner, because of their flexibility, qualitative methods allowed the researcher to advance a hypothesis and adopt methods to fit the local situation. This study also made use of narrative inquiry. As a research approach, narrative inquiry provides an effective way to undertake the systematic study of personal experiences and meaning: how events are constructed by active subjects (*Riessman 1993*).

Residents of Barangay Tando in Nueva Valencia, and Brgys. Sebario and Suclaran in San Lorenzo, all in Guimaras Province, served as the lead participants in the study. They were selected through a non-probability sample of residents in the community (i.e., no efforts were made to sample each element of the population with a fixed probability). Non-probability sampling is particularly suited to understanding qualitative and relational issues (*Pereira et al. 2005*). The sample size was not determined prior to data collection. Instead, sampling was sequentially conducted in each locality and each tool used the snowballing sampling, i.e., in which key informants were asked to name other people who should be contacted by the researchers, and accidental sampling, i.e., groups of people or individuals randomly met in the localities or with key informants are available to participate. It purposely included men and women, younger and older people, people engaged in different activities and people regardless of socio economic status, if the initial samples did not reflect this diversity. This technique, known as diversity or common sense sampling, was used to ensure variety and to avoid sampling errors on biases related to leadership, gender, age, visibility, and wealth. The questionnaire was administered to 88 respondents spread at 10% of the total number of households per barangay. The questionnaire was the main source of information related to the communities'/ households' adaptive capacity.

This study also used narrative analysis and analysis of narratives in analyzing data from interviews and focus group discussions. The grounded theory (*Harry et al.,2005*) and the analytic procedure of phenomenology (*Moustakas 1994*) were the bases for the analysis of narratives. To validate or corroborate the data obtained qualitatively, a questionnaire was constructed to elicit the respondents' forms of collective action, their motives in doing it, as well as respondents demographics and the communities' perception of the oil spill. These were tabulated, processed, and analyzed via the Statistical Package for the Social Sciences (SPSS) software. A summary of the different data collection techniques used is demonstrated in **Table 2**.

RESULTS AND DISCUSSION

Profile of respondents

Table 3 shows the profile of the respondents. The respondents were generally residing in big households, finished elementary education, identified fishing and related jobs as their main sources of income, and had monthly

Table 2. Different Data Collection Techniques Employed in the Study.

Technique	Nature	When Conducted	Participants	Output
Questionnaire	Written survey instrument soliciting preliminary data	July-August 2007	88 respondents representing 10% of total households	Quantitative data on household adaptive capacity index, and demographic structure
Participant observation	Actual, direct observation of the phenomena by the researcher	June - Dec 2007	Three barangays were explored and observed	Forms of collective action, indicators of adaptive capacity
Detailed case study	In depth analysis of the study variables presented in the cases	January 2008	Three main household with different connections to the resources	Transformative capacity, role of agency, collective action
Semi structured interview	Face- to- face interaction with respondents to draw out personal, intimate views	July-August 2007	88 respondents who answered the questionnaire	Quantitative data on collective action, narratives
Focus - group discussion	Interaction with key informants gathered in a group in a semi formal setting	February 2008	Two groups each with 8-9 members from each barangay	Data on collective action, adaptive capacity
Community validation and dissemination	An informal gathering of stakeholders to discuss the findings and validate them	March 28, 2008	15-20 participants from each barangay; (3) barangay captains	Validation of the descriptive findings, revised or added

Table 3. Respondents' Profile (N = 88).

Variable	Frequency	%
Gender		
Male	41	46.6
Female	47	53.4
Number of Persons in the Household		
1-2	9	10.2
3-4	25	28.4
5-6	30	34.1
7 and above	24	27.3
Educational Attainment		
Elementary Level	54	61.4
Secondary Level	24	27.3
College Level	10	11.4
Major Source of Income		
Fishing	51	58
Business/ Trading	17	19.3
Farming	5	5.7
Government Employment	4	4.5
Private Employment	4	4.5
Others	7	8.0
Other Source of Income		
Fishing	18	20.5
Business/ Trading	17	19.3
Farming	7	8.0
Allotment	2	2.2
Livestock raising	9	10.2
Others	35	39.8
Approximate Monthly Income (Php)		
Below 2000	37	42
2001 to 6000	41	46.6
6001 to 10,000	6	6.8
10,001 to 20,000	2	2.2
20,001 and above	2	2.3

income generally below PhP 6,000.00 a month.

Forms and Initiators of Collective Action

Collective action has been described as one taking various forms to include the development of institutions, resource mobilization, coordination of activities, and resource sharing, among others (*Poteete and Ostrom 2003*). It requires the involvement of a group of people through sharing of interest within the group and involves some kind of common action which works in pursuit of that shared interest (*Meinzen-Dick et al. 2004*). The oil spill incident identified the involvement of groups of people. Obviously, people's sharing of interest within the group was fundamentally manifested in their desire to survive from the disaster and their lives to return to normal – whatever normal meant to them. The pursuit of that shared interest was seen in the kind of common actions (form). Equally important were the catalyzers and initiators who facilitated in realizing the shared interest and the motives behind why such actions were made in the first place and how they were sustained.

The incident drew common actions from the residents and these were collectively carried out. The collective actions were categorized into three types: through formal organization, through informal organization, and through spontaneous action. Formal organizations are those organizations which have been formally organized, have sets of members and officers, regularly meet to discuss their programs and projects, and usually have legal personality because they are registered either to a government or private entity. The Tando Mangrove Growers Association (TAMGA), organized by the DENR for its mangrove project, falls in this category. Informal organizations, on the other hand, are those that are loosely bonded because of either immediate need or shared interest of their members. Informal organizations usually do not undergo the rigorous and technical process that formal organizations do. Example of this last type is the group of neighborhood women banding together to process their monetary claims in the provincial capital. Actions done spontaneously are realized through neither formal nor informal organizations but through the people's innate responses to a given stimuli. Their normative values and intrinsic beliefs usually guide them to act. Cleaning up the shoreline because they want it free from oil stain is an example.

The role of initiators in the collective action analysis has been a well-established factor in determining that action. In the broad categorization of coordination of action, the actions of formal and informal organization are usually initiated by one who has the authority and power. One who exercises authority could be the one socially and morally acceptable to lead the organization. On the other hand, power could be exhibited by those who have the resources and the position in the social hierarchy. These initiators or catalyzers play a very crucial role in making things happen in a collective manner.

The degree of involvement by the initiators varies as to type of coordination of action (**Table 4**). In a formal organization, the catalyzers are usually the leaders who have the personality to make things happen, to advance their common interest. They are likewise expected to motivate the members to act when collective expectations falter. In an association of saltmakers in Brgy. Suclaran, for example, the association president foresaw that they should not wait for the worse. Instead, she went to government agencies (Department of Science and Technology and Department of Health) and have a sample of the salt they made analyzed if it was fit for human consumption. With that act, she was able to elicit the needed action of her colleagues and peers on what would be appropriate such that the impact of the oil spill would not make them totally helpless.

In an informal organization, on the other hand, the initiators of action are usually the local government officials. The barangay captain, the municipal official and even the local politicians extend their preeminence over the subjects as political leaders without necessarily extracting something in return. It is safe to assume that such initiatives as facilitating livelihood programs and livestock raising among others, are what people would expect from these political leaders. If they (politician) would not do anything as in this case, initiate, they would be presumed as undeserving. A concrete example is seen in the processing of monetary compensatory claims. Some politicians who failed to help the residents in the processing of claims eventually lost in the succeeding local election for they were perceived to be not supportive of the people's cause.

In the case of spontaneous actions, the household leader is the acknowledged intitiator but the neighborhood and close associates of the household leader may also take the responsibility. Spontaneity usually leads to action and initiators can be dispensed outright. Evacuating to a safer area, appealing for help or making themselves available to the media are examples of spontaneous actions. These are done with the tacit approval of the household leader.

The initiators or catalyzers of collective action perform their role that is best gauged not by others but by those doing the initiatives themselves. The length and extent of such initiative solely rests on the constituents' ability to perform such action. Often, initiators' role is coterminus with the shared interest that has to be acted upon and realized.

Collective Action and the State of Environment

An important consideration is the relationship of identified collective actions *vis* a *vis* the state of the environment. The disaster that transpired created a flurry of

Table 4. Forms of Collective action and Its Initiators.

Coordination of action	Example	Initiators/ Catalyzers
Actions through formal organization	Organizing into associations Planting of mangroves Joining the clean-up through cash for work Involvement in programs and projects of joined by organization Enlistment for benefits/assistance	President or chairman of the organization; representatives of NGOs or GOs
Actions through informal organization	Taking part in communal /backyard gardening Signing up for livestock raising Processing documentary requirements needed for claim/compensation Taking part in alternative livelihood programs Making spillbooms Cleaning the shorelines	Barangay captain and local government officials; political leaders
Spontaneous actions	Planning and meeting as community members on what measures to do or steps to take Volunteering in the clean-up Contributing subsistence to volunteers Giving information to media and visitors Evacuating to another area or place Refraining from using the seawater for fishing and swimming Refraining from making salt	Appealing for help

collective actions. Assuming that the environment would gradually recover, what would happen to these collective activities? An indicator of the integrity of the environment is the amount of oil in the body of seawater. The higher the concentration of oil, the more degraded is the water resource. The volume of oil that had been dumped in the Guimaras coast apparently degraded the seawater and its surrounding areas. It took nearly a year to get rid of the oil and restore the vicinity to its pre-spill condition.

Nineteen incidences or forms of collective actions were identified. When the amount of oil in seawater was at its highest, these collective activities spontaneously took place. Two months after the spill, only eight incidences of these collective activities were ongoing. On close scrutiny, these actions required the assistance of both formal and informal organizations.

In the later part of December 2006, four actions were identified to have still existed and continued: planting of mangroves, involvement in programs and projects of organizations, taking part in communal backyard gardening, and processing needed documentary requirements for claims and compensation. **Table 5** illustrates the level of oil in seawater and the number of collectivity during the time.

The amount of oil in a body of water reflects the state of environment in an identified area. The collective activities taking place is a factor of the amount of oil in the body of water. The situation explains that people act collectively (in whatever way) when there is a sudden and abrupt disturbance in the environment. People will cease to act when normalcy is restored. This explains the visible collective activities made manifest in situations like the sudden rise of water level attributed to typhoon or threat of tsunami after an earthquake.

Actions that are ably sustained are basically those initiated by formal organizations. However, the extent and time span to which such actions may continue cannot be determined. Spontaneous actions and those attributed to informal organizations fundamentally cease when they are no longer needed.

Adaptive Capacity of Communities

Adaptive capacity is the ability to sustain the combined system of humans and nature in a desirable state along a desirable trajectory in response to changing conditions and disturbance events (*Carpenters et al. 2001*) and is often used in assessing the potential to adapt to future changes (*Folke 2003*). The variability of such adaptive capacity, however, is often drawn from a wide range of uncertain variables if adaptation is sought.

Adaptive capacity is a crucial factor in determining the impacts of the oil spill incident. If the net impacts of the oil spill experience, often called end point vulnerability (*O Brien et al. 2004*) are considered, this is the function of the exposure to hazards (oil spill experience) together with the sensitivity of the ecosystem and the social environment to that exposure, alongside their adaptive capacity. This view affirms that adaptive capacity is a component of vulnerability. Another aspect of adaptive capacity is the impending characteristics of communities that influence their propensity or ability to adapt. This may include referring to a diverse set of elements the precise composition of which may vary, depending on the scale of analysis, e.g.

Table 5. Amount of Oil in Water as Registered in the Identified months at Nueva Valencia, Guimaras, and the Incidence of Collective Action Taking Place.

Month (2006)	Amount of oil in seawater (mg l^{-1})*			Number of Cpllective Actions Realized
	Lowest Reading	Highest Reading	Average	
August	6.65	250	83	19
October	11.5	22	18	8
November	10	20.5	16	5
December	7	18	14	4

* DENR EMB-6, Western Visayas.

provincial, barangay, or household. Specifically, it may be the communities' capacity to modify exposure to risk, the households' ability to absorb and recover from the losses, and the ability to exploit new opportunities that arise in the process of adaptation.

Issues like scale, composition of indices and indicators, and the relativity of these indicators to specific countries or situations have been raised in an attempt to measure adaptive capacity. Many of the variables cannot be quantified and many of the component functions can only be qualitatively described (*Yohe and Tol 2002*). Despite this limitation, however, attempts on how to measure adaptive capacity have been made in the household level.

The household adaptive capacity operates in a small scale, usually in a household level. Attempts to capture the effects of different processes that contribute to adaptive capacity were carefully analyzed and included in the index. As applied to households affected by the oil spill, the index endeavors to observe what was only applicable to the three communities covered in the study. There were four main categories in the index with uniform 25 points for each. Economic well-being and stability was operationalized by the market value of the households' livestock and fishing gear resources. Income generated from other sources like secondary occupation, gifts, and grants from relatives was also included. Demographic structure was anchored on the dependency ratio (50%) and households with ailing or bedridden members (50%). Interconnectivity to higher level processes was derived from the range and scope of social capital (50%) and membership of social capital groups (50%). Lastly, natural resource dependence is derived from the contribution of fishing and allied activities to household well-being. Data were obtained from each household member. Each category was composed of five items with a maximum of five points. Effort was made to spread the items using the percentage in the structure. The aggregate scores of the different households were added to account for the over-all score of the households in the community and the aggregate mean scores were obtained (**Table 6**).

Economic well-being and stability. Barangay Sebario (SEB) has the highest mean score (M=9.93) in this category. Aside from fishing, the area has been used as a trading place for large volumes of fishery products like fresh fish and dried fish. It has a marketplace where traders and businessmen from other parts of Guimaras can buy the produce during market day (Wednesday). It also has substantial saltmaking grounds which was also an alternative livelihood source of the fisherfolk.

On close scrutiny however, this coastal community does not totally depend on the water resource. It has vast tract of agricultural land that enable the fisherfolk to alternately engage in farming when the sea cannot sufficiently provide for their living. Also, livestock raising is extensive. The presence of a wharf as a gateway to Negros island likewise boosts the economic activity in the area. The respondents, however, view themselves in this aspect as still far below with a median score of 12.5 points.

Tando (TAN) has the lowest mean score in this category (M= 9.18). This is attributable to the kind of infrastructure present in the area: poor road access, remoteness to the poblacion (approximately 10 km from Nueva Valencia and 22 km from Jordan, the provincial capital) and absence of socio-economic institutions like market, communications facilities, and educational opportunities. Because of its rocky (limestone) soil type, extensive agriculture is not feasible. Residents engage in charcoal making but this is not done on commercial scale. Livestock raising is an alternative resource the residents engage in but it is not sufficient to really make a big impact on their lives. Almost 90% of the households are dependent on fishing.

It can be inferred that economic well-being and the stability of a community are significantly affected when there is no infrastructure to boost its economy. Likewise, communities which are totally dependent on a single resource will obviously suffer the brunt when that resource is obliterated on account of a disaster.

Demographic structure. Sebario has the highest mean score (M=15.76) and Suclaran (SUC), the lowest (M=14.61). The mean score reflects that Sebario has households with few minor dependents but with considerable number of members who can augment the family income. Each household has smaller family size and less elderly or ailing members

Table 6. Forms of Collective action and Its Initiators.

	Barangay			Mean n=88	Interpretation
	TAN n=22	SUC n=33	SEB n=33		
1. Economic well-being					
a. livestock income	1.18	2.45	2.35	2.10	5000-9999
b. salaries and business	1.05	1.12	1.27	1.16	Below 5000
c. agricultural goods production	1.00	1.06	1.39	1.17	Below 5000
d. gifts from relatives and kin	1.36	1.12	1.76	1.42	Below 5000
e. family expenses	4.59	3.54	3.15	2.76	10000- 14999
Sub-total score	9.18	9.30	9.93	9.51	
2. Demographic structure					
a. number of dependents	3.59	3.15	3.09	3.24	5-6 dependents
b. minor dependents	3.27	3.33	3.48	3.37	3-4 dependents
c. earning capability	2.32	2.24	2.60	2.40	1-2 members
d. hospitalization cost	4.14	4.24	4.03	4.14	1001-1999
e. educational attainment	2.14	1.64	2.53	2.10	Elementary graduate
Sub-total score	15.45	14.61	15.76	15.25	
3. Interconnectivity to higher-level processes					
a. involvement in organizations	3.86	3.15	2.97	3.26	Fairly involved
b. community connections	3.73	3.52	3.58	3.59	Fairly connected
c. connections to the government	2.95	2.48	3.09	2.83	Less connected
d. access to vital information	3.91	2.97	3.12	3.26	Seldom accessible
e. access to financial resources	3.45	1.91	2.64	2.57	Least accessible
Sub-total score	17.91	14.03	15.40	15.51	
4. Dependence on water resource					
a. dependence on fishing	1.59	1.76	2.42	1.97	Highly dependent
b. mangrove dependence	2.95	4.48	3.91	3.87	dependent
c. beach/resort dependence	3.50	4.45	4.24	4.14	Fairly dependent
d. other employment dependence	2.82	2.67	2.91	2.70	Moderately dependent
e. contamination dependence	2.04	1.94	2.76	2.27	Moderately dependent
Sub-total score	12.91	15.30	16.24	15.06	
Total Score	55.45	53.24	57.33	55.33	Fairly Adaptable

Score	Description
81.00-100.00	Highly Adaptable
61.00-80.00	Moderately Adaptable
41.00-60.00	Fairly Adaptable
21.00-40.00	Lowly Adaptable
Below 20.00	Not Adaptable

compared to those in other barangays. The earning capability of the community is usually dependent on the parents or elder siblings (1-2 members) who obviously have limited education (elementary graduate, with a mean of 2.10).

Dependents that are not capable of earning a living obviously are a disadvantage in the adaptive capacity make-up of a household as more dependents are viewed as additional burdens. The values of the household and those of the community, however, place importance on having many dependents as possible.

This was evident in the failed family planning program when additional mouths to feed are regarded as family investment and seen as future earners. The minors, the elderly and even the bedridden member constitute a burden because of their inability to feed and fend for themselves. They are more of a liability rather than an asset in such set-up. The

picture would have been different if these dependents would contribute to the earning capacity of the household.

The level of education of the respondents can also be a factor in the adaptive capacity make-up of the household. Due to their inability to make decisions that are of far-reaching consequence and requiring higher order thinking skills, they are likely to settle for what is immediate and gratifying.

Interconnectivity to higher level processes. Tando residents rated themselves high in this aspect (m=17.91). This is explained by the extensive networks and connections the residents were actively involved in. Poverty incidence was high even before the spill, thus, development assistance and access to microfinance was already in place in the area. Further assistance trickled in and organizations were established after the spill. Unfortunately, this did not create a significant change in their economic well-being. Inability to invest in their connections which could have been used as needed capital (social) to further improve their current plight was observed. It was obvious that level of education, undesirable values, and low aspiration of the community members do not make this social capital as an asset.

Social capital, when used as an adaptive capacity has not been maximized in this case. A household whose contacts go beyond the village level and extend to other geographical ranges and connect with a variety of institutions has more adaptive capacity (*Adger 2003*). Membership with organizations alone does not guarantee a change in their status. A couple of organizations were established, and these have served as a milking cow for hopeful individuals with a promise for benefits in the future. The political interplay of the warring politicians likewise does not serve the common good. It was also observed that local politicians were not serious in alleviating the plight of the affected residents as evidenced by partisan and patronage arrangements.

The residents' access to vital information, which would otherwise aid them to formulate sound decisions, is less accessible (m= 3.26). Household radios and televisions are mostly used to entertain rather than to make them more informed. Subsequently, their connections to the government is also wanting (less connected, m= 2.83). This implies that the government services through its instrumentalities were not felt by the residents themselves.

Dependence on water resource. Dependency on water resource was determined by extracting the contribution of fishing and other water-related resources to household well-being. Sebario posted the highest mean score (16.24), with Tando, the lowest (12.91). Here, dependency on the resource implies that the higher the mean score, the higher is the household's adaptive capacity because the resource has not been the single source of livelihood. Sebario, a bustling commercial and agricultural barangay, viewed the experience as a wake up call on the connection of the resource to their existence. Absorbing future shocks requires not only foresight on the household but a will to change– to explore new opportunities brought about by the experience. In this instance, modifications and adjustments of dependence is imperative. If diversification is not realized, it may mean low adaptive make-up of that community or household.

Dependence on fishing is obviously high (m=1.97), with Tando showing the highest dislocation (1.59). After the spill, fisherfolk from the three communities were obviously dislocated. How they were able to counter the imminent adverse effects was seen in their adaptive capacity to look for new opportunities after the oil spill. Unfortunately, the idea was something to be desired and wanting for there was evident failure on the part of the fisherfolk to avail themselves of such opportunities.

In the case of Sebario, there was a slightly higher dependence on the water as a resource. This is attributed to its exposure not only to fishing but other employment opportunities related to water. Transportation services (ferryboat), although water related, have not significantly changed the nature of travelers going to and coming from Negros. The peripheral effects of the activity somehow diversified their sole fishing-related endeavor.

The natural resource in this case is the water resource that was contaminated during the spill. It created a dislocation among the fisherfolk as their livelihood was interrupted for some time. When the lifeblood of a household is at risk, a host of related problems eventually make its existence vulnerable. Conversely, a household that is not totally dependent on a single resource will likely recover whatever losses the resource incurs.

Adaptive Capacity and Collective Action

The study theorizes that collective action can be a mechanism for the community's adaptive capacity (*German et al. 2006*). When collective efforts are institutionalized, the same could be an instrument in realizing the desired trajectories (*Olsson 2003*), perhaps different from its current plight when the oil spill took place.

When the residents organized themselves into associations, subsequent responsibilities and expectations were in place. The Tando Mangrove Growers Association (TAMGA) was organized with the objective of helping members adapt to whatever effects the spill would have on them. Through the communal mangrove farm/plantation, members are expected to make most out of it by (a) participating in the rehabilitation of mangrove plantation, (b) improving their income through communal labor provided

by the organization, and (c) reaping future benefits when the mangrove itself will provide the needed shelter for the bounties of the sea. This will give the fisherfolk the opportunity to have a steady and reliable source of livelihood. The arrangement is envisioned to strengthen the community's adaptive capacity.

In its few months of operation, the original members dwindled as a result of structural and systemic concerns. Some members' failure to see the overall benefits without the current cost of staying far outweighed their desire to stay. Reasons for staying out of the organization include unfounded discontent with the leadership, inability to grasp the perceived benefits in due time, and inherent values and beliefs that run counter to any form of sustainability. The latter includes indifference, inability to forward or futuristic thinking, and personal discipline. Collectively, this may be attributed to the members' inability to think critically, envisioning and systemic thinking (*Michols et al. 2011*). The residents wanted to gain from the collective engagements but at the same time, held a view that contradicted the former – as when they had a hard time changing their attitudes, values, and beliefs. Justifying and rationalizing attitudes and values are the easiest way to do but they only lead to trajectories that will further make the residents vulnerable (*Farley et al. 2010*).

Responses to collective actions attributed through informal organizations and done spontaneously are evident. Communal gardening, volunteering for clean-up, and making spillbooms were easily engaged in and captured by the residents because of the simplicity and less amount of time to accomplish them. This affirms that complex issues, like climate change and economic meltdown, must be articulated in its simplest form to command positive and immediate action among the lowly educated individuals (*Dove and Bailey 2003*).

The relationship between adaptive capacity and collective action is well-entrenched in the interconnectivity to higher level processes as one of the aspects in adaptive capacity. The social networks, collectively called social capital, present as well as the capability building inherent within a group may be utilized to make the households more adaptive. When mothers intend to borrow money from micro-lending institutions, the networks operate in this end. In the same way, when favors have to be made in the processing of claims and compensation from the oil spill, an unwritten connection among those involved operates in this instance. Self-serving politicians exploited this connection and made the residents feel indebted in the forthcoming elections (*Magramo 2006*). Women mostly make the needed connection as expected in their gender role that reflects communal qualities (*Sanyal 2009*).

Transformative Capacity

The narrative analysis of the stories revealed a complex interplay of different factors about the respondents' experience of the oil spill. These include their conception of what shock means to them, their construction of what is an oil spill, the extent of mechanisms they used to cope with the perceived shock, the role of collective action in their adaptive capacity, and the insights they have gained from the experience as related to their adaptive mechanism.

Further analysis revealed the complementary as well as the conflicting notions on adaptive capacity and collective action. To them, collective action is only essential when the need arises. Collective effort, as in this case, happens only when there are emergencies, perturbations, and existing hazards. Other than those, it was very difficult for the resident to move forward as a means of strengthening their adaptive capacity mechanisms. They do not see collective action as a mechanism to be utilized to further enhance their adaptive capacity in those trying and hard times. Tensions associated with their livelihood loss and the corresponding adaptive approaches were evident as heard from their stories. If the same could be the basis of their vulnerability, the loss of their livelihood or the threat of losing it has some pecuniary consequence they have to cope with. It is in this premise where enabling conditions and functional diversity should have been in place and operated to reduce the possible impact of losing a source of livelihood. In the case of the desirable trajectories expected to be pursued, these were articulated as their transformative capacity. They were seen to be varied and complicated. Concepts like self-determination, dependence on self, sensitivity to others' plight as well as outright stubbornness or pushiness (negative) and persistence (positive) gave rise to this condition. The desire to move on, to adapt to, or even to look for help were proofs that the residents were not resigned to their hapless state. Instead, they looked forward to the time when they would be restored to their pre-spill condition or even improve it.

Agency and Transformative Capacity

The concept of agency was also articulated in the cases presented. Although its definition is akin to collective action, agency has played a significant role in the respondents' reaction to the oil spill. The notion of agency is identified as the most important indicator of capability building, both on the individual and the collective levels (*Holland, Lachicotte, Skinner, and Cain 2001*). *Vallas* (*2006*) argues that human beings have the capability to translate agency into actual actions. They can transform and shape the fate of their environment as structures that can be "made and re-made through human agency" (p. 466).

Agency is defined as "the capacity of individuals to act collectively or individually in a manner that either reinforces or undermines prevalent social relationships and organizational structure" (*Roscigno and Hodson 2006*).

According to Alkire (2005), human agency represents human capacity to "act on behalf of goals that matter to them" (p. 218). It is the core ingredient for positive social change.

From what happened during the spill, stubbornness and persistence are two concepts that also explain the residents' transformative experience brought about by the incident. When they are made to group together and make things happen for them, compliance at the start is not a problem. The issue of sustaining it, however, seems to be missing. Likewise, the option to permanently leave fishing but instead stay can at times be a manifestation of persistence – whatever their reasons may be for staying. Agency, as in this case, has not been used as a trajectory that would have otherwise made a difference in the lives of the residents.

CONCLUSIONS

The oil spill experience reveals a kind of collectivity which helps the community to act in times of environmental disaster. Forms, motives, and intentions in realizing them are varied as these are manifestations of the kind of response to shocks or perturbations. The need for one to initiate such collectivity, however, is essential as actions could not be realized without outside intervention. This affirms the absence of the link between agency and agents of developmental change as it fails to empower the affected sector to craft what is best for them. Sustaining those actions is likewise imperative in realizing the desired end reminiscent of an improved quality of life. In the end, the people who will always be at the forefront have to make concessions and compromises based on the kind of choices they make.

High adaptive capacity does not necessarily translate into actions that reduce vulnerability as these actions might traverse a different trajectory. Well-developed social institutions, economic resources and informed skills and trained personnel, access to information can make communities more adapted to any ecological disturbances. Such communal manifestations when harnessed collectively put that community in a better position to respond to any hazards.

The collective action initiated by formal organizations can be instrumental in achieving the needed adaptive capacity mechanisms. The enabling environment attributed to formal organizations by far will sustain whatever objective that requires collective effort. A strong leadership and follower support, as well as sound philosophical orientation of that formal organization, is essential to realize that end.

The transformative capacity of communities after the spill has not been strengthened as there are social transformations that were not realized to the desired social trajectories. There are existing practices and beliefs which need to be looked into and, therefore, must be addressed. A meaningful change can only be done when there is appropriate information, education, and communication about the oil spill. An informed and knowledgeable individual makes wise decisions and has the capability to be responsible for them.

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