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Research Article

**RESTORATION OF BITAN-AG CREEK AS A SOCIAL
ENGAGEMENT PROJECT OF MINDANAO UNIVERSITY OF
SCIENCE AND TECHNOLOGY, PHILIPPINES**

Victoria Sumanpan*

University OF Science Technology of Southern Philippines, C.M. RECTO AVENUE,
LAPASAN, CAGAYAN DE ORO CITY 9000 PHILIPPINES**Abstract:**

The study aimed to find out the awareness, effect, and sustainability of the restoration of the Bitan-ag creek which project is the product of engaging the local communities and other stakeholders locally and internationally. The study utilized the descriptive research method employing survey and interview. There were 25 stakeholders involved as respondents. The research questionnaire made was validated using Cronbach alpha which $r=0.92$. The interpretation was that the questionnaire is very reliable. The result of the study revealed that the stakeholders were fully aware of the project through visible activities like regular meetings, information campaign and annual evaluation of the project. Print and radio announcements were likewise done as strategies for awareness and advocacy campaigns. During the interview the participants as leaders and members of the stakeholders' groups were highly satisfied with the result of the activities acted upon by various sectors like the academe, the city government, the Department of Environment and Natural Resources – Environmental Management Bureau, the UN Habitat and the local barangays near and along the said creek. The stakeholders were satisfied with the effect of the project which is the pavement as an easement and the regular clean-up of the creek from solid waste and siltation among others. Although the project is continual it manifested cooperation among the concerned sectors which will ultimately lead to the restoration of the Bitan-ag creek in Cagayan de Oro City. Recommendation of the study as suggested by the respondents is that there should be more participation from the other sectors like the youth group and women group and that funding's provided for sustainability.

Keywords: *Bitan-ag creek, restoration, stakeholders, social engagement, solid waste***Corresponding author:****Victoria Sumanpan,***Department of Education, Planning and Management,
University of Science Technology of Southern Philippines,
C.M. RECTO AVENUE, LAPASAN,
CAGAYAN DE ORO CITY 9000 PHILIPPINES*

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INTRODUCTION:

Developed countries have done massive efforts in urban planning. One of the facts of urban planning is the preservation of rivers, creeks, and bodies of water which are considered waterways and habitats of various flora and fauna. A healthy and clean river or any body of water for that matter, results to a safer community [1]. Most developed countries have integrated their river systems into their development plans. This has improved their river water quality and ecological biodiversity. A revitalized river or creek or estero brings invaluable benefits. It is an indicator of the quality of life. This is not often the case in developing countries like the Philippines where some rivers and creeks are being treated as “backyards”. Domestic and industrial waste waters are indiscriminately thrown into the river connecting it into big sewers. Riverbanks and creek banks become a prime location of informal settlers exposing them to disaster risks like flooding, among others.

As an urbanized city in Northern Mindanao, Cagayan de Oro City has a river and a creek which caught the attention of the city local government and academe for preservation and restoration purposes. The city, together with the different and many sectors of the society has continually plan for the restoration of the Cagayan de Oro River and the Bitan-ag creek. Among the two rivers and 5 creeks the city has, most of the plans are geared towards the biggest river and a creek which has the longest stretch of 15 kilometers with 15 barangays living near and along that said creek. The study would focus on the Bitan-ag Creek Rehabilitation Project which the Mindanao University of Science and Technology had initiated nearly six years ago. The university is located near the Bitan-ag creek and whenever there is heavy rain coupled with a high tide of the sea, flooding is oftentimes experienced. There were researches already done on the solid waste management of their barangays or local communities and also researches on the biodiversity status and even the water quality of the creek. The extension division of the University undertook the leadership in engaging the local communities and the city’s leadership through a Memorandum of Agreement for the planning and implementation of the project. This process is termed social engagement which resulted in an alliance of 15 barangays, the city government, DENR-EMB, UN Habitat, and academe particularly the mentioned University.

The study would like to find out if the stakeholders as respondents are really aware that the project with corresponding activities is really and actually happening. Furthermore, the effects would also be evaluated and in addition, the respondents’ recommendation would be generated for the long-term sustainability of the project. Policy recommendation would likewise be generated. Rexroad (2012) [2] found out in her study that awareness of extension project in West Virginia University affects the success of the project.

This particular study is about the project which involved different sectors of society which are the stakeholders who will then gain the benefits as the project proceeds and succeeds.

Conceptual Framework

The study is anchored in the theory of Luna (1997)[3], which states that community development has three main goals namely: people’s welfare, people’s capability, and people’s participation. These 3 interrelated fields conveyed to the goals of social engagement. Social engagement or social participation means engaging the people in a community to organize and to identify a problem or problems and with the cooperation of everyone, sharing of expertise, a problem can be given a solution. The diagram below shows the process of the said Bitan-ag Creek Rehabilitation Project [4].

In consonance with social engagement and sharing of expertise, the state university has the function to share its expertise with the nearby community where it is situated and this particular function is assigned to the extension division of the University. The philosophy of the university’s extension services division is to serve the communities within its sphere of influence for the betterment of the quality of life. The center point of the study is the rehabilitation or restoration of the Bitan-ag Creek which is adjacently located to the university.

There were already at least 2 researches done by the university faculty concerning the state of the biodiversity (fauna & floral) of the said creek [5] and the needs assessment of the solid waste.

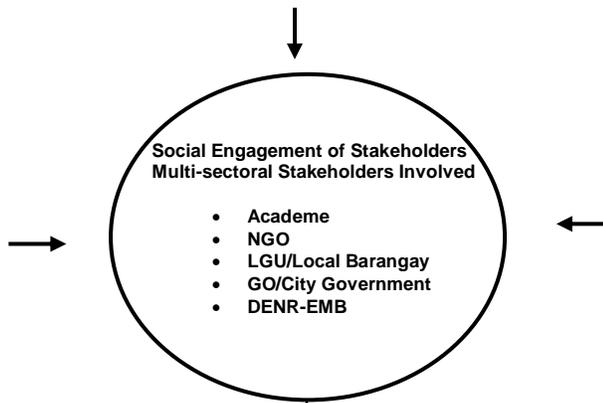


Figure 1

Schematic Diagram of the Conceptual Framework of the Study
(Adapted from Polestico 1996, Thomas – Slayer, 1995, Manalili 2000,
Participating Community Development Model)

The two studies recommended that there should be rehabilitation of the creek. Figure 1 is showing the projects process of action based on the strategic plan formulated by the Bitan-ag Creek Aliance. Furthermore, the result of the said project would reflect the social engagement of stakeholders namely: the academe' in this study it is the Mindanao University of Science and Technology. The non-government organization which is the UN Habitat, the local barangays and of course the government organization in the city of Cagayan de Oro and the DENR-EMB as key stakeholders. The stakeholders have played well its respective role, however, the university has to orchestrate the coordination and cooperation of the stakeholders, Executive Order No. 080-15 Creating the Hapsay-Sapa Council was issued by the incumbent mayor to rehabilitate the Bitan-ag Creek. The secretariat is the university. The study emanates from the recommendation of the study which theory was put to action through social engagement or social participation.

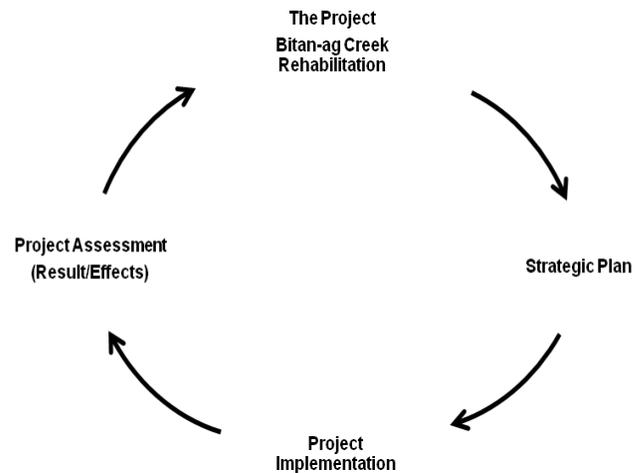
STATEMENT OF THE PROBLEM

The study sought to answer the following questions:

1. What is the demographic profile of the respondents in terms of:

Age	Average	Combined
Family income		
Gender	Educational Attainment	
Civil Status	Owned Appliances	
House ownerships		
2. What is the profile of the barangay in terms of social infrastructure?
3. What is the awareness status of the respondents concerning the Bitan-ag Creek Rehabilitation

- Project and the activities done for the restoration project?
4. What are the results of the Bitan-ag Creek Rehabilitation project?
 - 4.a Initiatives/Activities conducted
 - 4.b Satisfaction level of Stakeholders
 5. What are the suggested recommendations from the respondents for the sustainability of the project?
 6. What are the policy recommendations to sustain the over-all activities of the project?



METHODOLOGY:

The research design utilized is descriptive research design using the survey method with the questionnaire and an interview schedule. This design describes the state of the certain project being evaluated. An interview schedule – is a written list of questions, open-ended for use by an interviewer, in a person-to-person interaction. An interview schedule is a research tool or an instrument for collecting data, whereas interviewing is a method of data collection.

The locale of the study is the city of Cagayan de Oro, an economically growing city in Northern Mindanao. It was awarded as the “2nd most Competitive City” of the Philippines in 2014. Three barangays in the study which are near to the Bitan-ag Creek are the following: Barangay Lapasan, Barangay 22 and Barangay 26. The most populated are barangay Lapasan with 43, 611 residents and the least is barangay 22 with 3,020 population.

Twenty-five members of the stakeholders were purposively selected as respondents to the questionnaire. Another twenty were selected as respondents to the interview schedule.

There were two instruments used to gather desired data. There was a researcher-made questionnaire composed of 25 indicators and the second instrument was the interview schedule. The researcher-made question has dealt purely with the respondents' awareness of the BCRP activities. The questionnaire is composed of 25 statements or indicators concerning the Bitan-ag Creek project. The interview schedule was the result of the on-going projects and activities and the respondent's recommendations for the sustainability of the project.

The researcher-made questionnaire concerning awareness of the project was validated using Cronbach Alpha @ 0.5 level of significance. The instrument's reliability is = .92. This means the questionnaire is very reliable. The interview schedule

was validated by two experts for validity. It was used to interview the respondents.

The stakeholders of the Bitan-ag Creek Rehabilitation Project are composed of 15 barangays, the city government, the DENR-EMB and the university. Twenty-five (25) respondents were chosen to answer the questionnaire. Another twenty-five (25) respondents were interviewed using the interview schedule. A letter asking permission was delivered to the barangay chairman and was approved. The questionnaire was administered and readily collected then the interviewing followed.

The descriptive statistics utilized were frequency, percentage and mean. The Cronbach's Alpha for the reliability of the questionnaire was also used.

RESULTS AND DISCUSSION:

The presentation starts with the findings in response to every question of the study followed by discussion.

Question 1. What is the profile of the respondents in terms of age, gender, civil status, house ownership, average combined family income owned appliances?

Table 1: Distribution of the Demographic Profile of Respondents.

Profile	Frequency	Percentage	
Age	60 and above	4	16%
	50 – 59	5	20%
	40 – 49	10	40%
	30 – 39	5	20%
	20- 29	1	4%
Gender	Male	13	52%
	Female	12	48%
Civil Status	Single	2	8%
	Married	22	88%
	Separated	1	4%
House Ownership	Rent	2	8%
	Owned	23	82%
Average Combined Monthly Family Income	Php 25,000 and above	17	68%
	Php 24, 000 and below	7	28%
	Php 5,000 and above	1	4%
Highest Educational Attainment	Secondary	2	8%
	Post-Secondary/Vocational	2	12%
	Bachelor's Degree	17	68%
	Graduate Education	3	12%
Owned Appliances	Television	22	88%
	Stove/Oven	19	76%
	Radio	16	64%
	Computer	15	60%
	DVD/CD Player	14	56%
	Car	11	44%
	Motorcycle	10	40%
	Washing Machine	17	68%
TOTAL	25	100%	

As can be seen from Table I most of the respondents belong to the age range of 40-49 years old comprising 40% of the total respondents. This means the respondents are already in the age of the labor force and can be responsive to the demands of not only of the work- related jobs but as to civic affiliated activities. Most of them are males (52%) and married

(88%). 82% owned their houses or dwellings. As observed these houses are made of concrete and already stable. Many of them will be affected regarding loss of properties during the flood because they also owned appliances and vehicles. It would be a big loss or damage to property if the rehabilitation project will not be sustained.

Question 2. What is the profile of the barangay in terms of social infrastructures?

Table 2: Distributions of the Availability of the Resource/ Social Infrastructure in Barangay

Barangay Resources/Infrastructure	Frequency	Percentage
Barangay Multi-purpose Hall	22	88%
Health Center	13	52%
Women's Desk	10	40%
School	12	48%
Business Establishments	12	48%
Bantay Outpost	15	60%
TOTAL	25	100%

The barangays which served as the location of the study and where the Bitan-ag creek's constant overflowing is experienced have the very important and basic social infrastructures needed by a barangay as shown in Table 2. Most important is the barangay hall. Barangay 26 is socially situated just across the creek which reference is the university. Barangay 22 is situated next to Barangay 26 also near the creek's bank, whereas Barangay Lapasan is where the university is located. These three barangays surround the 7 hectares lot of the university. When overflowing of the Bitan-ag Creek occurs these

barangays suffer from the silt and dirty wastewater that overflows from it, thus not only the students are affected by "no classes" event but also there is a "halt" in the services supposedly to be served to the public by the barangay officials. The flood can cause the destruction of the buildings such as those shown in Table 2. Even the business establishments as well are affected by flood especially so that identified area of the study is at the center of the so-called "Central business district (CBD) along Claro M. Recto avenue of the city.

Question 3. What is the awareness status of the respondents concerning the Bitan-ag Creek Rehabilitation Project and the activities done for the restoration project?

Table 3: Environmental Projects and Training Conducted Regarding the Preservation of Bitan-ag Creek and awareness status of respondents.

Statements	Mean	SD	Description
1. The Bitan-ag Creek is a body of water located near the University and is overflowing during rainy days.	2.73	0.458	Fully Aware
2. The University had organized the Bitan-ag Creek Rehabilitation Alliance with the city government and the 15 barangays near the creek to preserve the said creek.	2.63	0.471	Fully Aware
3. The primary objective of the project is to prevent flooding because of the creek.	2.63	0.458	Fully Aware
4. The university had forged a Memorandum of Agreement with the 15 barangays and the city government.	2.43	0.516	Aware
5. The alliance had conducted strategic planning and the activities were guided by the results of the studies regarding the water quality and biodiversity did by professors of the university.	2.53	0.516	Fully Aware
6. Training were conducted such as climate change, solid waste management act and disaster risk reduction management.	2.47	0.488	Aware
7. The training conducted were very informative and served as the basis for barangay ordinances on environmental and Bitan-ag Creek Rehabilitation.	2.47	0.743	Aware
8. Quarterly meetings are conducted and mostly hosted by university and barangays take turns in hosting too.	2.33	0.640	Aware
9. The university had allotted budget for the creek rehabilitation project which expertise/faculty served as trainers/consultants.	2.23	0.640	Aware
10. There are monitoring and evaluation every end of the year since 2011 to 2013.	2.37	0.516	Aware
11. There is a linkage with an international organization such as UN-Habitat funded the boardwalk near barangay 22 beside the creek.	2.50	0.617	Fully Aware
12. An executive order (EO 080-15) had been issued by the city mayor to support the rehabilitation of said creek.	2.57	0.516	Fully Aware
13. Another MOA was forged between the University with DENR – EMB titled Adopt – an – Estero, which would monitor the water of the creek.	2.64	0.488	Fully Aware
14. There is a presentation of the result of the water quality of the creek.	2.44	0.516	Aware
15. Hapsay-Sapa is the name of the project with the city government created thru EO 085 to support the rehabilitation creek.	2.53	0.516	Fully Aware
16. A committee on information campaign was created by the alliance to disseminate education materials to barangay folks.	2.40	0.516	Aware
17. This environment program with the communities is sustained by means of the faculty in the Department of Environmental Science and Technology who continued to visit, monitor and evaluate the practices of clean-up of the creek in the barangay.	2.50	0.799	Fully aware
18. Some barangays created ordinances concerning the clean-up and rehabilitation of the creek.	2.47	0.507	Aware
19. All the barangays-members of the alliance collects garbage from households regularly thru trucks.	2.40	0.516	Aware
20. The city has plans to relocate the informal settlers living near the creek, the plan is suggested by UN-Habitat.	2.40	0.507	Aware
21. The communities involve are appreciative of this environment project led by the university extension services division.	2.44	0.516	Aware
22. Partners of the project such as the city government commend the University of this Project.	2.57	0.507	Fully Aware
23. The DENR – EMB likes the partnership with the university as this is the only university that first who adopted an estero or creek in the city.	2.47	0.488	Aware
24. The UN-Habitat had thanked the University for spearheading the rehabilitation and continuing to pursue the noble project.	2.60	0.516	Fully Aware
25. The project has been started since 2010 and still on-going with fulfilling the strategic activities.	2.60	0.507	Fully Aware
OVERALL MEAN	2.49	0.539	AWARE

The respondents were generally aware of the project activities.

Question 4. What are the results of the project?

Table 4: Activities Conducted Towards Rehabilitation of the Bitan-ag Creek by stakeholders.

Activities Planned	Activities Conducted	Stakeholder/s Conducting / in-charge
1.0 Forge a MOA for Bitan-ag Creek Alliance	1.0 Had forged a MOA : Bitan-ag Creek Alliance	The 15 barangay, the city government initiated by the university, DENR-EMB
2.0 Physical Rehabilitation of the creek <ul style="list-style-type: none"> Regular clean-up Regular dredging/ declogging or desilting. Acollection of garbage 	2.0 Physical Rehabilitation <ul style="list-style-type: none"> Weekly clean-up Weekly dredging/ desilting/ declogging. Weekly/ monthly collection of garbage by truck. 	<ul style="list-style-type: none"> The city government thru the Hapsay Sapa Council, the barangay The city government thru the Hapsay Sapa Council. The respective barangays
3.0 To attain class B water quality.	3.0 Class C water quality of the creek attained. (Lluisma, 2015)	DENR-EMB
4.0 To construct easement to provide anaccess road for heavy equipment used to dredge the creek e.g. backhoe.	4.0 Easement in thesemi-permeable pavement was constructed at barangay 22 and on-going easement at Barangay 26 adjacent to the University.	The city government, Barangay 22, UN-Habitat
5.0 Training to be done on climate change, DRRM and solid waste management - Informative and Education Campaign (IEC)	5.0 Training in Climate Change, DRRM, and solid waste management were conducted. -IEC ongoing	The Mindanao University of Science and Technology.
6.0 Issue ordinances onclean-up and rehabilitation of the creek.	6.0 Issued ordinance on regular Solid Waste Management and creek clean up.	The barangay Chairman.

Table 4 revealed what activities were successfully conducted by the respective stakeholder.

Question 5: What are the recommendations of the respondents?

Table 5: Recommendation from Respondents to sustain the project.

Statements/Recommendations	Frequency	Rank
1. To continue the project.	10	2
2. Clean up of the creek.	20	1
3. Proper garbage disposal.	10	2
4. The project should be done from Camaman-an to Lapasan.	5	3
5. Visible signagesare put in the proper places within the vicinity of the creek.	5	3
6. Relocation of informal settlers dwelling near and along the creek.	10	2
7. More participation from youth group and women group.	5	3
8. Budget is needed.	5	3
9. Monitoring and evaluation should be regularly conducted.	10	3.
	5	3

To sustain the project the respondents ranked first the clean-up of the creek.

CONCLUSIONS:

The process of social engagement or social partnership is an effective tool for community extension project with the university monitoring the events as in the Bitan-ag creek Rehabilitation Project where every stakeholder is mindful of his assignment for the improvement of the quality of life. The result though not fully done already is a success.

Question 6. What are the policy recommendations for sustainability of the project?

POLICY RECOMMENDATIONS

1. For the university to foster more interactions with the leaders of local communities and city government through constant meeting/conferences and symposia on environmental issues involving the women and youth groups' and business establishments.
2. Creating a long-term institutionalized partnerships or nexus with like-minded national and international organizations.
3. Continual enforcement of the ordinances issued in the local communities towards the Ecological Solid Waste Management Act.
4. A regular monitoring and evaluation shall be done and that this project shall be properly documented. This shall be assigned to an extension worker/community organizer of the university.

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