

Elaborating Stakeholder Perceptions on Watershed Management Issues, as a pre-requisite for collaboration for sustainable development

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Introduction

Perceptions on watershed related issues can exist along various spectrums. The identification of stakeholder perceptions on watershed management problems, causes and related solutions is purported as the first step in terms of ascertaining whether or not a collaborative approach towards watershed management in Trinidad can be effective. However, the perceptions of stakeholders can be the same as well as they can differ based on specific factors such as their location and their level of involvement with the problem.

This study sought to assess stakeholder perceptions on watershed management issues, by investigating of community group representative's views on watershed problems, causes and related solutions using focus group methodology. According to Kaplowitz and Hoehn (2001), focus group discussion yields more valid and significant data that would be difficult to generate from an interview. Focus group assessments were therefore conducted as part of this study so as to be able to validate the conclusions which were developed from the stakeholder perception survey (Suvedi and Kaplowitz, 2016).

Purpose (Objective)

The primary purpose of this paper was to elaborate key issues related to previously identified stakeholder perceptions on watershed management problems, causes and related solutions perception survey.

Materials and Methods

The methodology for this paper followed the approach used by Webster and Ganpat (2006), whereby interpretative research was adopted. Interpretative research, grounds the researcher in the context of the participants and helps to understand perceptions through the meanings that people assign to them (Webster and Ganpat, 2006). Participants for the focus group were targeted from four watershed communities that participated in an earlier stakeholder perception survey. The 27 participants were recruited because of their direct involvement in community groups that have a vested interest in addressing watershed management issues in their communities. Focus Groups were therefore conducted in Mausica (n=7), Maracas St. Joseph (n= 8), Lopinot (n=8) and Guanapo (n= 4).

In order to conduct the focus groups, participants were asked to voluntarily participate in the focus group discussion which would last no more than 90 minutes. Individuals who chose to participate were invited to a central location within their community (the community center or community leader's house), with the incentive of refreshments being offered in return for their participation. Confidentiality was guaranteed and participants were assured that if they did not wish to participate they could stop at any moment during the discussion. The focus group sessions were carried out during the months of February, March, June and September of 2015. Each focus group session was carried out by the researcher acting as the focus group moderator, the responses were documented with the assistance of two note takers on the day of the focus group as well as recorded with a voice recorder. Closed- ended guide questions were used to gather in-depth views as to the watershed management problems, causes and solutions from participants.

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A total of 11 structured guide questions were developed and subsequently evaluated for content validity by two subject experts. The following guide questions were therefore asked;

1. What do you think are the watershed problems in your area?
2. What do you think is the single most significant problem relating to watershed management in your area?
3. Which problems happen most frequently/ often?
4. What would you say are the causes of the watershed problems?
5. What is the cause of the most prevalent problem?
6. What do you think are some possible solutions to the watershed problems in your area?
7. What do you think can be the best possible solution to watershed management issues for your area?
8. How do you think you can contribute towards addressing the problems you identified?
9. What can you do as a community organisation to contribute towards addressing the problems you identified?
10. Who is currently involved in watershed management activities in the community?
11. Who are the other individuals or organisations you think should also be involved?

Each focus group discussion was transcribed and NVIVO 11 was used to analyze the qualitative data. This software facilitated sorting and auto-coding of the data. Once the data was auto-coded, a word count was carried out to identify the most frequently used words from the transcripts, this aided in conducting the thematic content analysis. Thematic content analysis, was subsequently used to examine themes across the data set and look for patterns in the responses. The developed themes were compared across the four focus groups, in order to identify similarities, variations and outstanding comments among the respondents.

Main Results

Four main issues were framed for the watershed management problems. These include; Environmental Degradation, Unsustainable Agricultural Practices, Governance/Institutional Pitfalls and Social Stressors. The following table (Table 1) presents a summary of the dispersion of the perceptions as per each watershed.

Table 1: Dispersion of Perceptions per Area

Areas	Issues			
	Environmental Degradation	Unsustainable Agricultural Practices	Social Issues	Governance/Institutional Pitfalls
Lopinot	14.06%	4.61%	9.36%	13.93%
Mausica	11.34%	-	1.55%	18.47%
Maracas/ St. Joseph	3.25%	0.96%	1.27%	3.02%
Guanapo	13.42%	-	5.03%	11.54%

Based on the above table, the Lopinot and Guanapo Watersheds had the most issues related to watershed problems as a result of environmental degradation. Unsustainable Agricultural Practices and Social Issues were also perceived as popular issues in the Lopinot Watershed. In the Mausica Watershed, Governance/ Institutional Pitfalls was seen as the most popular issue as compared to the other Watersheds. The following table (Table 2) presents the issues and the direct quotes supporting the perceptions of the participants in regards to the four main issues that have been framed.

Table 2: Issue Frames and Supporting Direct Quotes

Issues		Issue frame/ Direct Quotes	Aspects of the issue	Solution
Environmental Degradation	As a result of actions from persons not from within the community	... “They (quarry operators) widen the road on one side and then dump on the dirt on the other side. They just leave the dirt there. What you think happens when they do not remove the dirt? It goes into places it is not supposed to be, either the river of when it is the dry season, the dust floats on the air” (R1, Guanapo) ... “Industrial waste is being dumped into the river polluting it” (R2, Mausica) ... “There is poor garbage disposal in the area especially from the local tourists who come to visit the area” (R3, Lopinot)	- External Social Pressure - Negatively Impacting Community - Flooding - Disturbance of their water source	-Enforcement of the laws -Stop quarrying
	As a result of actions from persons from within the community	... “Deforestation has caused an increase in flooding...they (some residents) started off cutting small areas behind their homes, then slowly they began to move further and further into the hillsides” (R2, Lopinot) ...“People are cutting the lands on the hillside, and this is causing the water in the river to be lower” (R1, Lopinot)	- Environmental and Water pollution	
Unsustainable Agricultural Practices	... “Sometimes these portions of lands which have been slashed and burnt are not cultivated and are left to fallow hence increasing erosion and flooding” (R2, Lopinot) ...“Poor farming practices...farmers cutting trees along the river bank and once they get their fill there they are moving further up into the valley as a result of this, there has been a decline in water supply” (R4, Lopinot)	- Deforestation - Water pollution - Loss of wildlife	-Agencies should work together (Collaboration) -Enforcement of the laws	
Governance/ Institutional Pitfalls	... “The quarry operators are not doing anything to address this problem. They use a lot of 10 wheeler trucks in the area to transport the material and this damages the road” (R1, Guanapo).	- Water pollution -Loss of Forest cover	Enforcement of the laws	

	... “Forestry division supposed to be taking care of the forest in our area, but they are not...enforcing the law is a problem...people cutting the reserve...there is flooding in the area...the people who supposed to be enforcing the law liming with them (law breakers) and drinking with them and not enforcing the law” (R4, Lopinot) ... “Poor implementation of laws regarding the use of the forest...if people are charged for doing the wrong thing, then they would stop” (R4, Lopinot) ... “There are incomplete retaining walls behind our houses, the Gov't start the project of the retaining wall, then they do not complete the project. When it rains, the water comes into our yards, the place gets flooded” (R3, Mausica) ... “Incomplete work by government agencies. They come and start something, and to me it remains unfinished or incomplete” (R2, Mausica)	-Flooding	
Social Stressors	... “Religious people and local tourists using the river for whatever purpose and they leave their garbage behind just like that...The local tourists have no respect for their surroundings/ water paths. You do not get this type of problem with the international tourists” (R4, Lopinot) ... “People also come and interfere with the natural course of the river...what you think happens when this is done? Is trouble for us who from the area” (R1, Maracas/ St. Joseph) ... “People do not understand forest preservation and as such, they are cutting too much of the forest. This is causing us to have a shortage of water” (R5, Lopinot)	-Pollution of environment and water -Lack of concern for community residents	

Discussion and Conclusion

Given that there is a significant amount of overlap with respect to the institutional landscape governing watershed management in Trinidad, the issues which have been framed by the participants indicate that there is a need for addressing these issues through a collaborative approach. A collaborative approach is considered particularly since, these participants (from within the watersheds and the institutions) have the ability to affect (determine) a decision or action, while at the same time causing those to be affected by the particular decision or action to be impacted either positively or negatively (Grimble and Wellard, 1997).

The majority of the issues framed were related to environmental degradation and social stressors. This gave an indication that proper law enforcement is needed to ensure that these issues are adequately addressed. However, the necessary institutional stakeholder should be properly identified and utilized in

order to ensure proper law enforcement and public adherence. An approach to collaborative watershed management is seen as the most appropriate approach in that, collaborative watershed management partnerships all have a common goal of attempting to resolve conflicts over the use of natural resources, with them meeting on a periodic basis to discuss or negotiate the management of streams, rivers or watersheds (Leach and Pelky, 2001).

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