

# Harmonizing Diverse Perspectives on Environmental Issues Toward A Unified Mitigation and Remediation Program

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環境が悪化し始めたとき、その緩和と改善のためには草の根運動がイニシアチブを取り、それを国家へ、より広い社会へと展開してゆく必要がある。

## Abstract

This study examines local environmental issues and evaluates their relevance to regional, national and global concerns with the hope of proposing remediation and mitigation initiatives that could generate a ripple effect toward an equitable solution. An inventory of pressing environmental concerns as perceived by various social sectors is enumerated and explored.

From the initial findings, an instrument that classifies these concerns into broader regional, national and global issues was designed. Preliminary data were shortlisted and thematically organized, then ranked based on perceived severity and impact. Levels of awareness, importance and urgency of providing solutions to the identified issues were also determined. The shortlisted issues were presented to selected respondents and were clustered into five pressing regional and national environmental issues. These were then linked to the global issues stipulated on the United Nation's Report on the "Emerging Issues on our Global Environment" (UNEP Year Book 2013).

The resulting profile served as basis for the proposed mitigation and remediation program. The best practices obtained from the survey were considered. A consolidated program was drafted and evaluated for technological and legal viability.

**Keywords** Diversity, Global implications, Mitigation, Remediation, Environmental issues

## Introduction

One of the unifying endeavors shared by many countries is the battle against environmental degradation. Now more than ever, Asian communities, governments, businesses, and broader civil society are voicing their concerns regarding the effects of degraded ecological systems and the negative impacts of climate change. Economic growth tends to obscure the challenges that affect the region such as corruption, poverty, discrimination, other social conflicts and environmental threats. If not urgently

addressed, these challenges could threaten Asia's development and economic growth (Asia Foundation, 2014).

The most significant step in working toward an equitable solution is an accurate recognition and identification of the problem. In an environmental study, robustness of data is affected by individual perspective and ability to identify consistent, updated trends in local and eventually global environments. Despite rapid advances in communication technology, social media and other remote sensing facilities,

serious data gaps remain. Even in highly isolated ecological units, diverse patterns of interaction and roles can be observed. In a community of human population, it is not surprising that perspectives differ from one individual to another, or between and among groups. In addition to larger and better data on changes in the environment, clear and measurable targets are needed in order to properly address problems, if the aim is to increase the chances of success in remediation and mitigation initiatives. In most international initiatives, the most successful are environmental agreements that address well-defined issues with specific goals and measurable targets, and comprehensive data.

Frameworks for the collection of statistical data and for economic-environmental accounting have also been developed to assist countries in developing, organizing and applying environmental and related socio-economic information. Despite these, grass-roots level information is inaccurate, if even available for policy makers and proponents of environmental initiatives.

What is not measured cannot be managed. Persistent data gaps and lack of proper environmental monitoring are among the challenges ahead. Internationally comparable data are the basis for tracking global environmental change, as well as for tracking progress towards the achievement of goals and objectives.

Lessons learned from the development of environmental indicators on environmental sustainability, and from other experience, could be invaluable to further guide this process.

This study aims to investigate and enumerate pressing environmental issues and concerns from an identified study site. From the gathered data, a remediation and mitigation program is proposed with the hope of addressing needs based on severity and urgency at the study site level.

## **Methodology**

### ***Study Site***

This study covered the province of Laguna, one of the provinces in the Calabarzon Region of the Philippines. Located 30 kilometers from Metro Manila, the country's capital city, it is the third largest province in the region and one of the major economic hubs of the country. It is composed of six cities and 24 municipalities. Its proximity to the capital city, as well as its connectedness to various parts of the country through modernized road systems make it easily accessible for business and other industries.

Laguna is also rich in natural resources. It has Asia's third biggest lake, the Laguna de Bay, which supplies the province's freshwater resource requirements and form part of the people's livelihood. Nestled in the foothill of a mountain range, it provides an attraction for tourism and is a source of many forest-based products. The soil is rich and fertile, and because of its favorable climate, it can support agriculture. It has vast alienable and disposable agricultural land, and about 24% of its total land area is forestland, which is ideal for growing crops and exotic plants.

The province has a huge population of 2.7 million (2010 Census of Population and Housing), with about 67% of them in the urban region. A responsible, hardworking, and highly skilled work force abounds in the area. Furthermore, Laguna has a more than sufficient stable power supply to cover the requirements of businesses and industries.

Figure 1 shows the location map of the study site with the identified cities and municipalities from which respondents were randomly obtained. The study covered 3 cities and 15 municipalities classified according to income classes. This represents 60% of the total number of cities and municipalities in the province.

### ***Respondents***

A total of 350 respondents participated in the study. Eighty percent of the respondents are residents of Laguna, the rest are from the neighboring provinces

in the Calabarzon region. The percentage and number of respondents from the five municipal classes of Laguna are shown in Figure 2. A total of 300 respondents from the province and 50 from the neighboring province on the region participated in the formal survey, as well as the number and percentage of respon-

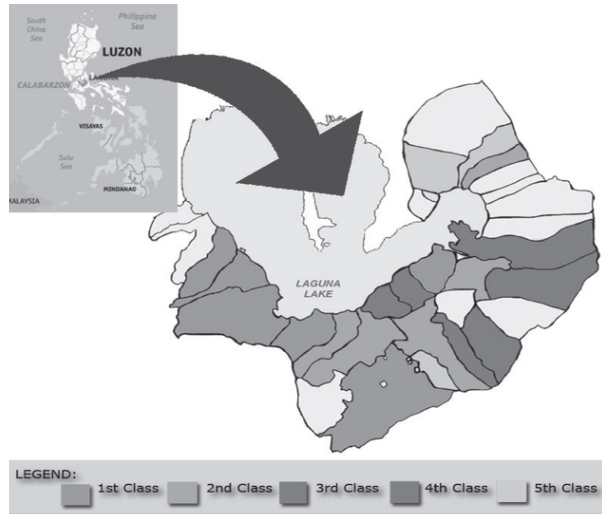


Fig 1 Location map of the study area

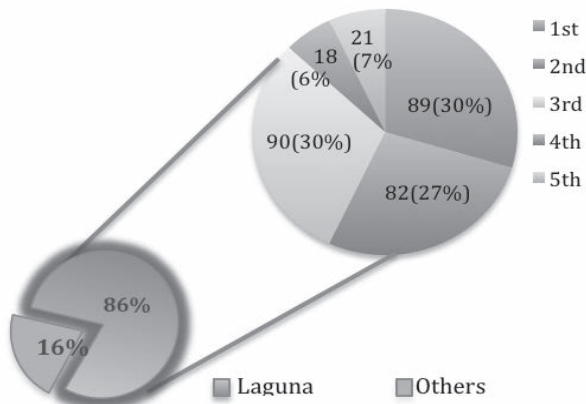


Fig 2 Distribution of Respondents in Calabarzon and in the Province of Laguna

dents per municipal class.

For those from the province of Laguna, there is an approximately equal number of male and female respondents. The sampled respondents consisted mostly of the youth sector. (Youth being defined by UN as these belonging to age 15-25), from average size families, and of average family income (Table 1).

## Results and Discussion

This study employed an inductive- investigative approach to problem identification. Initially, enumeration of environmental issues and concerns through informal survey was carried out. The generated preliminary list, supported by literature gave rise to the development of an inventory of environmental issues and concerns based on perspectives and level of awareness of Laguna residents. The instrument was administered to random population of residence from the province. Occurrence of these issues and concerns at various levels of their environments was determined and tabulated per municipal class as shown in Figure 3.

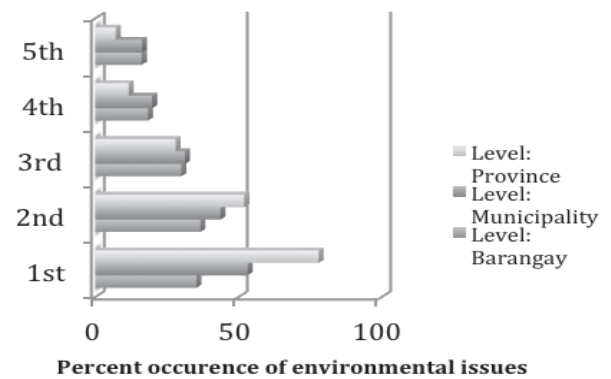


Fig 3 Occurrence of environmental issues and concerns on different territorial levels

Table 1 Demographic characteristics of the respondents

Demographic Parameters										
Sex		Age			Household Size			Income Status		
male	female	youth	middle	senior	small	average	large	low	middle	high
144	156	216	72	24	42	168	68	158	132	18

As shown in Figure 3, first-class municipalities identified most of the issues and concerns on the inventory as existing in their community, particularly at the provincial levels.

The number of occurrence of these issues decreased consistently across municipal classes from the first to the fifth class. In the fourth and fifth-class municipalities, identified issues and concerns are mostly perceived at the local levels.

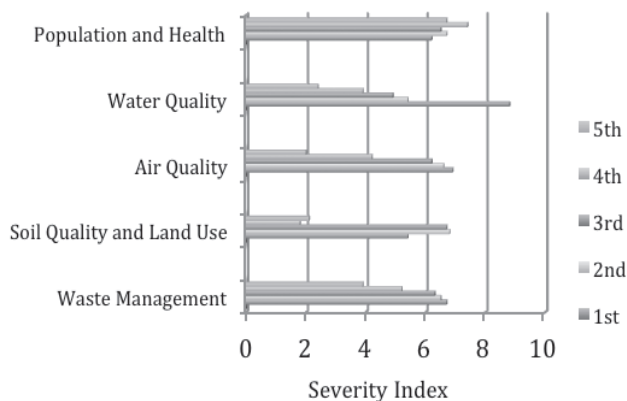
These results indicated that perception of environmental problems is related to income class and socio-economic standing. More affluent communities tend to be more sensitive to environmental issues compared with the poor and marginalized groups.

The enumerated environmental issues and concern were then grouped into broader themes of environmental problems to reflect their sense of severity and urgency based on the perspectives of the respondents. The data are summarized in Figures 4a and 4b. For the first-class municipality, the most severe problems are on water quality, air quality and waste management. The least severe area for this group is soil quality and land use. For the fifth-class municipality, the most severe problems are population and health and waste management. Less severe problems for these groups are water and air quality, as well as soil quality and land use. For the respondents coming from second, third and fourth-class municipalities, there is moderately severe perception of all problems.

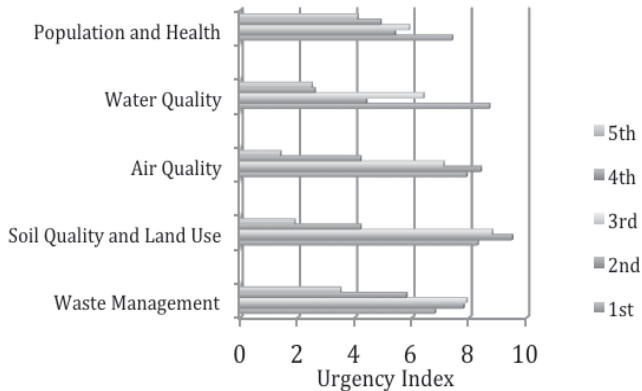
In terms of urgency of solutions to the problem, all municipalities expressed consistent sense of urgency for the problems they identified as severe. Thus, water quality ranked the highest for the first-class municipality. Air quality, waste management, land use and health and population are moderately severe and of moderate urgency for the second-class municipality. The fifth-class municipality's most urgent concern is population and health, follower by waste management. Water quality, air quality, soil quality and land use have low urgency indices for the fourth and fifth-class municipalities which are incidentally rural and agricultural in nature.

Consistency in the perception of severity and urgency is a valuable consideration in the design of mitigation and remediation initiatives. It serves as a framework for assigning high-priority areas for immediate action. For instance, in a community with severe and urgent water-quality issue, water conservation, groundwater protection and potability surveillance projects are likely to be supported and implemented.

The identified environmental problems are also ranked and compared to national and global issues. As shown in Table 2, local issues are not parallel to national and global priority items in the perspective



**Fig 4a Severity index of environmental issues and concern of the different municipal classes**



**Fig 4b Urgency index of environmental issues and concerns of the different municipal classes**

**Table 2 Local Issue Rank Priority of National and Global Concerns**

Rank in Local Perspectives	Top National Issues	Rank in Local Perspectives	Top Global Issues
	Destructive fishing and coastal infrastructure		Global Warming
	Deforestation		Clean and renewable sources of energy
4	Pollution		Persistent signs of degradation: from water and air to land and biodiversity
5	Waste Disposal	2	Sustainable access to safe drinking water
	Decline of natural resources and biodiversity	5	Sustainable access to basic sanitation

of the respondents. In the local scenario of Laguna Province in the Philippines, the primary concerns may not fall on any of these broad categories. Many are not familiar with concepts on biodiversity and renewable energy. They also have misconceptions about global warming. Even as an archipelagic area, people have little concern about fishing practices and coastal infrastructures. Although they recognize that the country is facing environmental challenges, they arbitrarily relate them to natural catastrophes like typhoon, earthquake, volcanic eruptions and the like.

The information obtained from the survey was validated by actual site visits. A proposed remediation and mitigation program was drawn up based on existing and established government and non-government projects. Extent of operation, participation and success rate are considered. The design mainly aims to make information available to the stakeholders and from them draw insights on how implementations can be carried out to suit their specific needs. Highlights of information are lessons drawn from international organizations pursuing a fight to save the environment, and the best practices of the neighboring nations that build their resilience and struggle to save the environment.

The provincial capitol of Laguna boasts of many projects on Environmental Protection and Preservation of Natural Resource, Agricultural Productivity

and Fishers and Coastal Management, and Land Use and Urban Planning. The existence of these projects however is not known to the majority of residents of the province. Thus, in the initial phase of the Remediation and Mitigation Program, a massive information campaign, local government support and the peoples' participation were the primary objective and indicators of success.

In the future, more suitable and specific need-based action plans will be formulated and implemented in selected communities in the province.

## Summary and Conclusion

This study attempted to reveal the perspective of the residents of Laguna, a province in the Philippines, on the environmental challenges they face at various territorial levels. The study revealed that there is little equivalence on perceived severity and urgency of the local, national and global environmental issues and concerns.

Compared to other dimensions of sustainable development, the environmental domain is weak in terms of specific, quantified goals and targets. Apart from a few targets such as those related to climate change and biodiversity, many goals and targets included are set out in general terms and mainly demonstrate the stakeholders' and proponents' good intentions.

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The province of Laguna is confronted with a host of environmental problems that threaten the well being of its population and the sustainability of the said habitat. The demand for aggressive implementation of economic and industrial growth in the region is placing a strain on the health of its ecology. This condition is aggravated by the lack of informed concern about the environment.

A sound and sensible remediation and mitigation approach is believed to be one rooted on understanding the real scenarios, realizing its impact and connectedness to wider scopes of problems, issues and concerns, and the importance of action-based solutions that are local in approach but global in perspective.

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