

# ECOLOGICAL FOOTPRINT ANALYSIS OF THREE SMALL BARANGAYS IN NORTHERN SAMAR<sup>1</sup>

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## ABSTRACT

Ecological footprint analysis is a technique that estimates the consumption of food, material and energy and measures their corresponding effects on the social and ecological systems. The study designed specifically analyzed and estimated the food and material consumption of families of the three barangays nearby University of Eastern Philippines. Solid waste management as a concept was intertwined in the total analysis as food consumption is inextricably linked with waste production.

Observations, interview and the employment of survey questionnaire were made and used to gather essential data. Results of the analysis provided database of the trends in food consumption significant in drawing out priority areas and concerns for future researches and helped identify where conservation, development and policy interventions are needed.

Not all food commodities available in the three barangays were locally produced. People consumed more than the resources they produced, and consumed food products of other localities. The big number of family members allowed the consumption of larger quantity of food commodity. The purchasing habit of the families was greatly affected by their monthly income and the distance of their barangay from the source of the food commodity to be purchased.

## I. INTRODUCTION

The state of human population and environment are inextricably linked. As people use resources and create wastes, ecosystems are affected. The combination of increasing human numbers and consumption, together with various activities are changing the planet on a scale and with a speed that is unprecedented. Ecosystems are being transformed by human activities. Changing patterns of resource use are among the root causes of biodiversity loss. Rising population densities pose considerable challenges in ecologically fragile regions of the world, as more people come to depend on a fixed, shrinking, or degraded natural resources.

Population and environment are two concepts present on a hot debate. The current state of natural resources and human populations and the underlying socio-economic realities shape population dynamics and influence people's use of resources. Documenting the links between population and environment using data collection of demographic and socio-economic data, or quantifying the consumption "footprints" helped identify where conservation, development, or policy interventions are needed.

Causes of this problem can be accounted to a lot of reasons. High fertility combined with poverty, lack of health services, and lack of educational and economic opportunities intensify pressures on natural resources. These are often consumed at rates beyond sustainable levels, degrading the resource base and habitats for wildlife and reinforcing the cycle of poverty and ecosystem exploitation. This is a common situation in many of the poorest parts of the developing world.

Along these observations this study therefore examined the patterns of food consumption and the solid waste management of the three barangays. It reviewed the socio-economic characteristics of the three barangays; determined the

food commodity available in the three barangays; measured the level of food commodity consumption of families; and examined the food commodity purchasing habits of the three barangays.

## II. METHODS

Observations, interview and self-structured questionnaire were designed to gather data on resource use and food consumption patterns. Part of the data on socio-economic characteristics of the three barangays was obtained through reviewing secondary data/documents available in the barangays.

## III. RESULTS AND DISCUSSIONS

### Socio-Economic Characteristics of the Three Barangays

Considering the age of the respondents, majority is within the 51-above age ranges and age range 21-30 ranked second. This means that majority is matured member of the community and is responsible in the management of the production and consumption activities of their families. The data implies an increase in the population in few years as 21-30 age bracket is but the sexually active members of the community. Bangkerohan had the highest number within this age range. The data further implied more food production and consumption activities.

Female outnumbered the male which means that there is a great possibility of population increase. This further means that most females are just confined in their household and not active in the food production activities. However, this could also mean that females are more educated as they actively respond to the questions in the interview.

The data on occupation had a relation from the data about sex; majority was housewife and a greater number too, did not respond. Other forms of occupation had insignificant frequency. The no-response of some respondents could mean no stable occupation of the head of the family which implied that there was no permanent food production activity.

In terms of the educational attainment of the head of the family, majority reached the elementary level; however, more college graduates were observed in Galutan. Having elementary level as the highest educational attainment meant poor/difficulty

in food production and consumption management. Assistance on how community people think of and do alternative activities to augment family income and manage well production and consumption of daily needs was implied.

A parallel observation of 5-6 total number of family members was observed in the three barangays which means more food requirement to satisfy the needs of family members. This implies design of alternative livelihood activities to augment production.

These families have less than Php 5, 000.00 monthly income which could not be enough to satisfy the needs of the family. Alternative livelihood activities have to be designed to increase income to answer the needs of the family.

### Food Commodity Availability in the Three Barangays

#### Cereals

Rice is at all times available in the three barangays; however, not all of the needs for rice are satisfied by the produce from within the barangay. A greater majority did not respond to the question related to the availability of corn in the community. This could mean non-availability and non-production of the same commodity in the three barangays. This jibes with the observation that corn is now a rare produced commodity in the province; if there are, harvests are not milled; they are boiled and sold as "meryenda". Both cereals are not produced in Bangkerohan which implies dependence of the barangay for their daily need for cereals in the nearby barangays or in Catarman. Measures have to be done by the families, the Local Government Unit and other allied agencies for the families to produce what they need.

The availability of fruits in Barangay Bangkerohan had relation with the short distance of the barangay to the central source, Catarman. More fruits were available in Galutan; however, interviews showed that they were not locally produced. Families were dependent on their need for fruits to what were available in the market in Catarman. The same was true in Doña Lucia, and only very few of the fruits were available and locally produced in the barangay.

The availability of the vegetables was not a problem in the three barangays as shown in the data presented. Some of these vegetables were locally produced. The no-response indicated the non-production of these products in the barangay which

implied dependence of these barangays on what the nearby barangays and the market in Catarman provided. This implied the need to design extension programs to help community people produce more vegetables.

In terms of marine products, the data showed more produce from Doña Lucia. Observations and interview attested that they used to supply needs for fresh fish of the constituents of UEP. Salted and smoked fish were not observed in bulk quantity which meant that fisher folks needed to sell their produce immediately to answer their daily household needs. This implied the need for processing skills which may be provided by UEP and other allied agencies.

On the other hand, Galutan and Bangkerohan were observed to be dependent again on what the market in Catarman provided in terms of fresh water and marine products. This data could mean the non-utility of the fresh water as source of fish and other products.

Meat, egg, pork, beef and carabeef were noted to be available in the three barangays except for carabeef and beef which were shown in the table as non- available in Galutan. The no-response as verified in the interview meant that they were just dependent on the supply for beef and carabeef in Catarman. The more yes-responses could mean more local producers and providers of these products in the barangay.

### **Food Commodity Consumption of Families Per Week**

With the 5-6 family members, each family consumes six (6) to ten (10) kilos of cereals per week was observed in Doña Lucia and Galutan. However, a greater number of families in Bangkerohan consumed less than or equal to 5 kilos of cereals. It could be inferred that the cereal consumption is dependent on the family income and the number of family members.

A greater number in Dona Lucia, Galutan and Bangkerohan consumed 1 kilo, 5 kilos and 2 kilos, respectively. This could mean that root crops are no longer served on the table as substitute of rice as staple food.

Majority of the family in the three barangays consumed only 1 kilo of fruit per week which meant that fruits were not significant in the daily meal. However, this could imply less awareness of the nutrients derived from fruits which essentially had impact on the health of the barangay people. The

need for local seminars on awareness especially on the substitute of fruits had to be conducted.

More than five kilos of vegetables were consumed by every family in Dona Lucia, 1 kilo per family in Galutan and 4 kilos in Bangkerohan. Observations made confirmed that the more consumption of vegetables in Doña Lucia was because of their less interest on fish as they had more of it everyday. Galutan locally produced more vegetables but consumed less. This implied that selling the locally produced products was given more premium than consuming them for the family.

A majority of the families in Doña Lucia consumed 3 kilos, 1 kilo in Galutan, 4 kilos in Bangkerohan which meant that fish and other marine products were but significant sources of protein among Filipino families.

A greater number of families both in Doña Lucia and Galutan consumed only 1 kilo of poultry and meat products every week. The high price of the product could be one of the reasons for the less consumption. On the other hand, more families in Bangkerohan consumed 4 kilos of poultry and meat products per week.

### **Food Commodity Purchasing Habits of the Three Barangays**

A greater majority of families in Galutan and Bangkerohan purchase rice in Catarman while families of Dona Lucia used to buy rice in some sari-sari stores in the barangay. The distance of the barangay to the town proper could be a significant parameter considered as to where to buy. Local production and availability of the product could be other considerations.

Root crops are locally produced in Galutan and Bangkerohan while a greater majority in Doña Lucia had no response which meant that there was no production of the same in the barangay. This may be because fishing was the major source of livelihood in the area.

In Doña Lucia, fruits served were locally produced, while majority of families in Galutan and Bangkerohan had no response which meant that they bought fruits without knowing the source. Interviews revealed that families used to buy fruits in Catarman but they did not specifically know where these fruits are produced.

A majority of the vegetables in Dona Lucia and Bangkerohan were produced locally while Galutan was dependent on what the market in Catarman provided.

In terms of the fresh water and marine products, Doña Lucia as one of the UEP providers for fish, locally produce these products while Galutan and Bangkerohan used to buy these products in Catarman. This is because of the distance of Galutan to the seawater; however, Bangkerohan has a good access to the coastal area. This implied for a deeper community motivation to recognize the utility of fresh water as source of fish and other products.

Similarly, Galutan and Bangkerohan were dependent on what the market in Catarman provided in terms of meat and poultry products. Community people of Doña Lucia used to buy the same products in some sari-sari stores in the barangay. This meant that Catarman is the central market for major commodities.

#### **Purchasing Habit (Number of times of buying per week)**

A majority of the community people of Dona Lucia bought rice daily; while Galutan and Bangkerohan had for once or twice a week. The daily purchase in Doña Lucia could be related to the source livelihood people had. Observations revealed that after selling their fish products, they immediately prioritized to buy rice as it is the daily necessity of every family.

Root crops were bought daily by the majority of the community people of Doña Lucia, twice a week by majority of people in Galutan and once a week in Bangkerohan. It could be inferred that root crop could still be a substitute for rice.

Fruits were bought as the need arises; however, many families in Bangkerohan bought fruits daily. This could be because of the short distance of the barangay to the Catarman market.

A bigger number of families in Doña Lucia and Bangkerohan used to buy vegetables everyday while some families in Galutan bought as the need arises. This meant that in Galutan vegetables were available anytime in the barangay.

For fresh water and marine products, Doña Lucia and Bangkerohan bought as they needed the product while Galutan used to buy the products twice a week. Distance could be a factor considered in the number of times of purchase.

A number of respondents in Doña Lucia revealed that poultry and meat products were bought as money was available, twice a week for Galutan and daily for Bangkerohan.

#### **IV. SUMMARY AND CONCLUSION**

Consumption patterns played a critical role in population dynamics and impacts on the environment. Each human activity left a “footprint” on the planet Earth, with its size and depth determined by how many resources each person uses.

The barangays had no existing comprehensive socio-economic profile. The food commodity available in the three barangays was not all locally produced. People consumed more than the resources they produced, consuming food products of other localities. The big number of family members allowed the consumption of larger quantity of food commodity. The purchasing habit of the families was greatly affected by their monthly income and the distance of their barangay from the source of the food commodity to be purchased.

#### **V. IMPLICATIONS AND RECOMMENDATIONS**

The high consumption of food commodities was fueled by a lot of drivers such as poverty, lack of education and economic opportunity, the desire for large families and there might be a lot more. These drivers caused degradation of natural resources. This implied for more economic opportunities, heightened reproductive health information and in-depth awareness of the various ecological services afforded by the natural resources and in return how conservation measures have to be done to end up with sustainability.

The University as an academic institution must help in the drafting of the socio-demographic profile of the barangay. Further studies have to be done to measure the threats of population dynamics to natural resources vis-à-vis the state of the population and the environment. Economic, political and social forces driving population-environment connections had to be the concern not just of community leaders but of everyone.

The barangay must have a survey of the quantified commodity locally produced, locally consumed and commercially distributed to other localities. Programs and/or activities had to be designed to increase the purchasing power of the community people. The extension unit of the university may come in, in designing activities.

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