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Establishing Indicators for Urban Poverty-Environment Interaction in Tanzania:

The Case of Bonde la Mpunga, Kinondoni, Dar es Salaam

Matern A. M. Victor
Albinus M. P. Makalle
Neema Ngware

RESEARCH ON POVERTY
ALLEVIATION

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Abbreviations

CBD	Central Business District
DFID	Department for International Development (UK)
IIED	International Institute for Environmental Development
REPOA	Research on Poverty Alleviation
SLA	Sustainable Livelihoods Analysis
Tsh	Tanzanian shillings
UK	United Kingdom
UNEP	United Nations Environmental Programme
URT	United Republic of Tanzania

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Matern A. M. Victor, Albinus M. P. Makalle, and Neema Ngware

(August 2005)

ABSTRACT

The premise for this study is that urban development and especially livelihood opportunities for the urban poor are, in most cases, limited by adverse environmental conditions created by growing centers of population and activity. The various individual and collective human activities that contribute to urban development have numerous positive and negative environmental consequences. However, the degree and direction of causality between processes of impoverishment on the one hand, and the processes of environmental change or degradation on the other hand, in urban settings in Tanzania, has not been closely examined or widely covered in existing literature. In view of this research gap, the study focused on community responses to environmental change at a micro-level to understand and describe the links between poverty and the environment (i.e. poverty-environment interactions).

This report is a case study of Bonde la Mpunga in Dar es Salaam and provides substantive results about the relationships between poverty and environment from data collected in that area. Historically, Bonde la Mpunga was a wetland used by indigenous inhabitants as rice fields. However, the major economic activity was fishing, with the catch supplying the expanding urban market of Dar es Salaam. Despite the natural hazards of the area, Bonde la Mpunga continues to expand by providing cheap accommodation. As established in the study, securing shelter is the first priority for urban dwellers.

The study also found that the growth of this unplanned settlement was the result of abundant natural resources in the area together with a lack of land control systems for the growing urban environment of Dar es Salaam. In the absence of land control systems and planned development, the population in the area has increased as well as the consumption of natural resources, and immense quantities of wastes have been generated. This has had severe effects upon the environment. At household and community levels, residents have developed strategies to cope with the situation, which have further degraded the area because of the scramble for limited environmental resources, such as water supply, sanitation and waste disposal facilities.

Given the fact that Bonde la Mpunga will continue to attract people, positive interventions need to be put in place, such as an effective housing policy in unplanned areas supported by legal, institutional and administrative frameworks. To monitor poverty-environment changes in an unplanned settlement, it is necessary to determine the level of house congestion, the crowding within dwellings, the quality and quantity of waste disposal facilities, and the type and size of livelihood activities, which were found to be the major causes of further environmental degradation. These are considered as necessary indicators for understanding and describing poverty-environmental changes, which in turn can be used for formulating appropriate interventions.

1 INTRODUCTION

1.1 Background

Important qualitative differences exist between poverty-environment interactions in urban areas compared with those in rural areas¹. One major difference is the poverty status between urban and rural areas. While the rural poor are dependent on natural capital (the natural environment as a source of livelihood), the urban poor depend on physical capital (urban physical infrastructure), and human capital (employment) as the sources of their livelihoods. However, the urban physical infrastructure is in an inadequate and poor state due to the scarcity of resources for the provision and maintenance of the infrastructure, coupled with the macro-economic problems faced by many governments in developing countries, which limit the capacity of public authorities to cope up with urban development². The extent of the deterioration in urban environments further limits the already overstretched national and urban development efforts to provide physical infrastructure, which further erodes the health and welfare of urban residents.

Poor urban people, living in unserved areas, remain in socially unsatisfactory conditions for a long time unless specific policies are initiated to alleviate their poverty³. Given that Tanzanian investment in the social sector is low, many urban areas are in poor environmental condition, and the urban poor have developed strategies that enable them to cope with this situation. A mix of individual household and community survival strategies are developed over time to enable the urban poor to cope with their circumstances. However, very few urban poor have the ability to cope over long periods. Vulnerable as they may be, they continue to live in these degraded areas, failing to climb out of poverty or sliding into worse poverty⁴.

The poor environment described above is typical of Bonde la Mpunga, a sub-ward of Msasani Ward in the municipality of Kinondoni, within the city Dar es Salaam. This sub-ward is therefore taken as a case study for understanding community responses to changing environmental conditions. Bonde la Mpunga is an unplanned settlement existing outside urban development policy and regulations. As a result, solid waste collection and disposal services by Kinondoni Municipal Council have not been extended to this area. Hence, there is virtually no storm water drainage and the streets are filthy. Ponds of stagnant water collecting on streets and off-street are breeding areas for mosquitoes, increasing the potential for contraction of malaria by residents.

1.2 Statement of the Problem

Although Bonde la Mpunga is a degraded area, it has been accommodating many people for a long period of time. The people have developed livelihood strategies, which enable them to cope up with urban poverty in this poor environment. Until now, these livelihood strategies have not been studied to examine how they could be improved and transferred to other areas with similar environmental characteristics. This study therefore sets out to understand how the Bonde la Mpunga community members adapt to a degraded environment, and how the degraded environment hinders their livelihood activities thus further impoverishing the residents.

¹ Leach and Mearns, 1991

² Sanderson, 2000

³ Perlman *et al.*, 1996; Satterthwaite, 1999

⁴ URT, 2002

The study also identified a limited set of indicators that capture the essence of poverty-environment interactions in urban areas at this time when significant economic and institutional change are taking place. The study sought to identify different ways in which these indicators can be used to understand poverty-environment interactions, and to monitor poverty reduction achieved through environmental changes.

1.3 Significance of the Study

Understanding the links between poverty and the environment is a pressing issue in developing poverty reduction strategies, and indicators are needed, not only to monitor conditions and changes, but also to guide interventions that seek to improve the management of poor urban areas. Any search for livelihood strategies for the populations living in unserved urban areas will be greatly enriched and made more relevant by basing studies on the initiatives already taken by the people themselves. The livelihood strategies need also to be studied for further understanding, and for amplification or modification, by linking them to scientific knowledge and advances. To achieve this, community livelihood strategies must first be identified, described and analysed in their dynamic contexts.

1.4 Objectives of the Study

The general objective was to establish indicators that describe urban poverty-environment interaction by studying community responses to environmental problems in Bonde la Mpunga. The specific objectives were:

- to identify and describe poverty issues and manifestations in Bonde la Mpunga;
- to identify and rank types of environmental problems as perceived by different social groups (analysed against demographic variables such as gender, age, socio-economic status, level of education, etc.);
- to identify and describe the relationships between poverty and environmental problems in Bonde la Mpunga;
- to develop poverty-environment related monitoring and evaluation indicators; and
- to propose appropriate interventions that will create an enabling or supportive environment.

1.5 Research Questions

- (i) What are the issues and manifestations of poverty in Bonde la Mpunga?
- (ii) What are the types of environmental problems in the area?
- (iii) How are the identified environmental problems perceived by different social groups (by gender, age, socio-economic status, level of education, etc.)?
- (iv) What impact do the identified environmental problems have on poverty and vice versa?
- (v) What poverty-environment indicators describe the interaction?
- (vi) What are appropriate interventions?

2 THEORETICAL BACKGROUND AND LITERATURE REVIEW

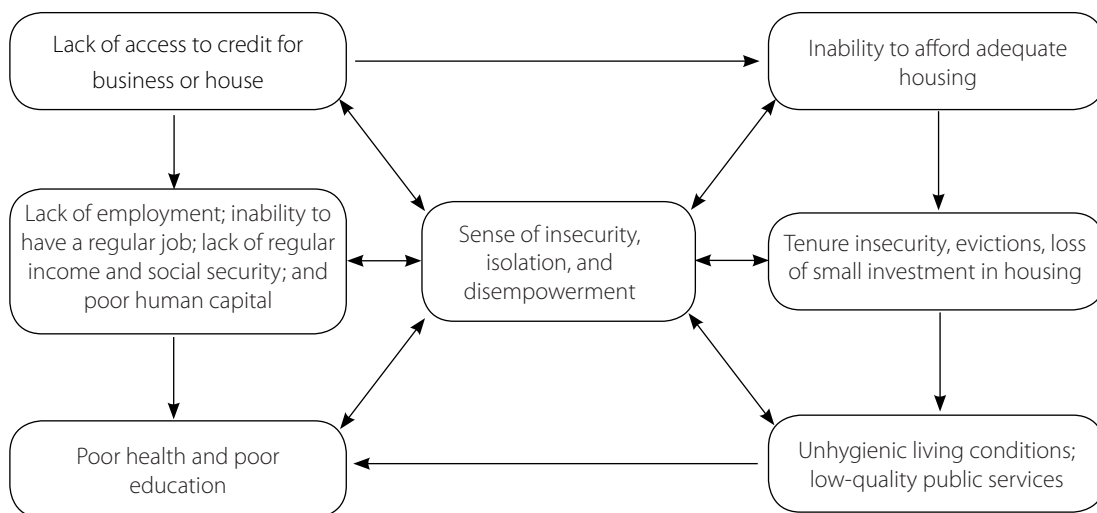
2.1 Dimensions of Urban Poverty

A number of poverty reduction strategy papers assess poverty against five separate dimensions: income and consumption, health, education, security, and empowerment⁵. However, urban poverty is often characterised by cumulative deprivations; one dimension of poverty is often the cause of, or contributor to, another dimension, as illustrated in Figure 1. In general, poverty and vulnerability (a dynamic concept of the susceptibility of falling into poverty) in the urban context can be related to three distinctive characteristics of urban life:

- (i) commoditisation (reliance on the cash economy),
- (ii) environmental hazards (stemming from density and hazardous locations of settlements (REPOA, 2003) and the exposure to multiple pollutants), and
- (iii) social fragmentation (lack of community and inter-household mechanisms for social security relative to those in rural areas)⁶.

Insecurity as a dimension of poverty is defined as the vulnerability to a decline in well-being. The shock triggering the decline can occur at the micro-level (household level), at the meso-level (community level), and/or at the national or international level⁷.

Figure 1: Cumulative Impacts of Urban Poverty



Source: Baharoglu and Kessides, 2001

The relationships presented in Figure 1 indicate that urban poverty is a multi-dimensional, dynamic, complex, institutionally-embedded, and location-specific phenomenon. Thus urban poor do not belong to a homogeneous group. They experience poverty in different ways, and require a range of policy responses and measurements, which are inevitably complex and diverse.

⁵ Baharoglu and Kessides, 2001

⁶ Moser, Gatehouse and Garcia, 1996

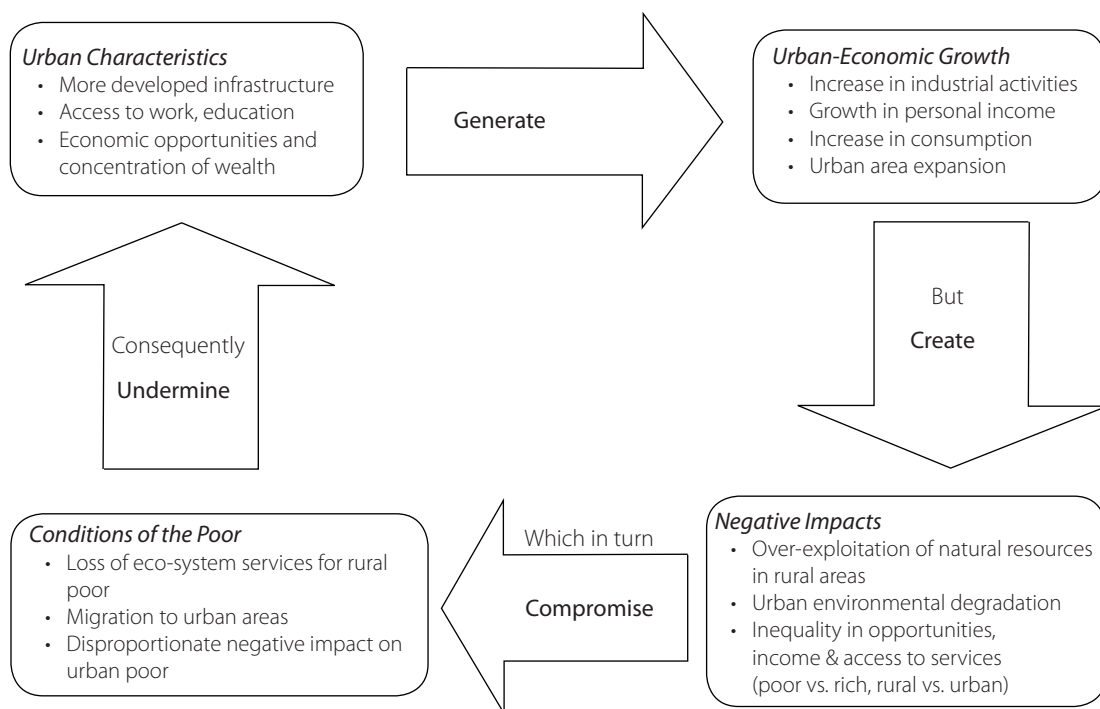
⁷ World Bank, 2000

2.2 Poverty-Environment Interaction

Many environmental problems (shocks and stresses) have origins far removed from poor people's influence⁸ yet affect their strategies to adapt to environmental changes and environmental management conditions. Some environmental changes result from natural disturbances and perturbations in climate, water, soils, and vegetations systems, especially in rural areas. However, it is important to understand that poverty and the environment are strongly linked to one another. Therefore, programs for poverty alleviation should not damage the environment of the poor, which would only undercut gains in one area with losses in another. Urban environmental conditions have major effects on the health, opportunity, and security of poor people. Another main link is that improving environmental conditions can help to reduce poverty. The interaction between poverty and the environment has been referred to as the poverty-environment vicious circle in the "ALEX 2003" meeting report (UNEP, 2003).

The primary factors influencing this vicious circle (Figure 2) were identified as management practices and ownership of common property resources. In rural settings, the collapse of traditional management systems converts the above factors into open-access to resources. However, in an urban setting, it is the transformation of structures and processes that influence access to, and use of, environmental related services. These urban processes have been studied and it has been verified that they generate threats to environmental sustainability, and in turn, increase poverty, creating the vicious cycle.

Figure 2: Vicious Cycle: Urbanisation, Poverty, and Environment



Source: UNEP, 2003

According to UNEP (2003), urban environmental degradation is caused by more people, more production and consumption, limited control, lack of standards and enforcement, and geographic and topographic conditions. The notion, as suggested in Figure 2, is that the relationship between

⁸ Parry *et al.*, 1988

poverty and environment is mediated by institutional, socio-economic, and cultural factors. This observation, also noted by Prakash (1997), presents a complex situation to analyse. The complexity of the relationship often contributes to inadequate understanding and policy responses⁹.

2.3 Approaches to Understanding Poverty-Environment Interaction

The complex relationship between poverty and the environment has been investigated empirically through case studies, an approach that poses difficulties for understanding the phenomenon. This is because the diversity of poor people's situation and their relationships with the environment means that a good understanding of who the poor are, and of their priorities is needed. The complexity of the relationship also often contributes to inadequate understanding and policy responses¹⁰. Nonetheless, many approaches (a combination of which is used in this study) have been developed to gain a better understanding of the links between poverty and the environment.

One simplistic approach views poverty and environmental degradation as a downward and mutually enforcing cycle¹¹, referred to as the 'poverty trap thesis' by Prakash (1997). It is simplistic in the sense that studies have shown that poor people in some areas have acted not as environmental degraders but as environmental sustainers¹². In some cases, the poor have become environmental activists, and hence, the idea of a circular relationship between environment and poverty ignores the complex circumstances in which the poor find themselves¹³.

A second approach uses the concept of environmental entitlements for understanding the relationship between poverty and environment. The key issue raised by this approach is that the links between environmental change and impoverishment are not direct, but are mediated by the interactions of the poor with particular environments, structured by macro-level processes¹⁴. This approach highlights the role of institutions in mediating relationships between people and environments¹⁵.

Other approaches adopt similar views that the relationships between poverty and environment are complex, and that there are many different types of relationship (positive and negative). These approaches focus on poor people's access to, and use of, the environment and natural resources. Hence, a number of papers¹⁶ on poverty and environment recommend indicators that reflect these factors to understand the linkages. Indicators can provide a way of identifying and breaking down the linkages, leading to more appropriate and effective policy and project interventions. Essentially, indicators are needed to track changes over time, to indicate progress, and to compare locations.

A wide range of studies to determine appropriate and relevant indicators have been conducted throughout the world, at local, national and international levels. Initiatives have developed indicators and methodologies, such as human development indicators and world development indicators. These indicators are generic (internationally agreed) and were developed from a review of environmental issues relevant to the poor. Many of them are sector-specific, and address poverty and environmental issues separately.

⁹ Markandya and Galarraga 1999

¹⁰ Markandya and Galarraga 1999

¹¹ Forsyth and Leach, 1998

¹² Broad, 1994

¹³ Ambler, 1999; and Scherr, 2000

¹⁴ Leach and Mearns, 1991; and REPOA, 2003

¹⁵ Leach *et al.*, 1997

¹⁶ Perlman *et al.*, 1998; IIED, 2001; Nunan *et al.*, 2002; Osuntogun, 2002; and Reed, 2004

A number of organisations have been involved in generating these generic poverty-environment indicators, including the World Bank, the Department for International Development (UK) (DFID), United Nations Environmental Programme (UNEP), and the International Institute for Environment and Development (IIED).

The approaches used to develop generic poverty-environment (Table 1) are said to fall short of providing information to decipher why changes are occurring¹⁷. At the same time, generic indicators are not intended to explain why certain changes are not taking place. Indicators give a rough guide to prevailing circumstances and associated changes, but a more challenging task is to monitor changes in poverty-environment interaction in both directions at the micro-economic level. It is at this level that the effects of transforming structures and processes need to be captured to counter the forces driving the downward spiral of poverty and environmental degradation.

Table 1: Examples of Existing Source of Generic Poverty-Environment Indicators

Organisation	Poverty-Environment Indicator
World Bank	Relationship between environmental conditions (e.g. quality of water supply and levels of pollution and wastes) Impact of resource loss as a determinant of poverty, measuring how loss of access to resources "affect the well being of the poor"
DFID	Environment and health Forest cover Soil degradation Water quality and quantity Natural disasters Tenure and property rights Sanitation
UNEP	Urban ecosystems are linked to human health, security, adequate nourishment and income generation – factors pertinent to poverty reduction Health: respiratory diseases related to bad air; water borne diseases caused by contaminated water; bad health caused by malnourishment and lack of shelter; low physiological condition caused by deteriorating surrounding ecosystems Adequate nourishment: urban and peri-urban agriculture Security: habitats near polluted sites; garbage disposal; contaminated rivers and/or ecologically hazardous sites Income generation: urban and peri-urban agriculture
IIED	Identifies the range of city-related environmental hazards by scale (within house and its plot, neighbourhood, workplace, city or municipality within larger city, city-region or city periphery, and links between city and global issues) and type of the following hazards: <ul style="list-style-type: none"> • Biological pathogens • Chemical pollutants • Physical hazards

2.4 Conceptual Framework

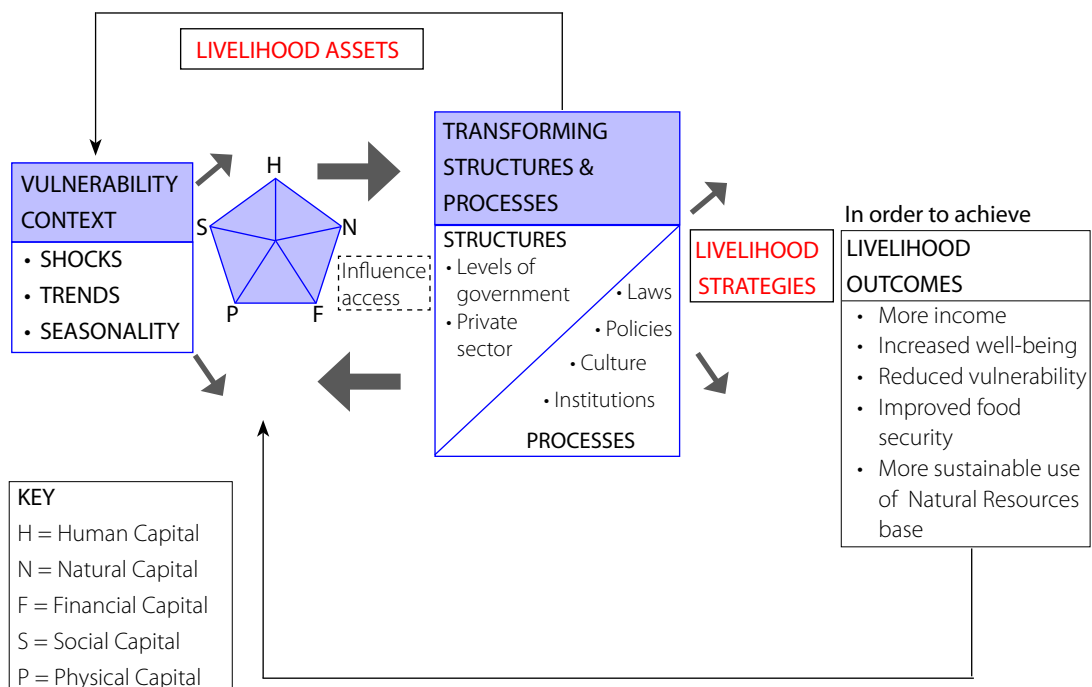
Recognising the need for indicators at the micro-economic level, where the challenge is to link household dimensions of poverty to environmental information, this study used the concept of livelihood to understand poverty manifestations. The concept of livelihood builds on a broad interpretation of poverty, and provides a way to closely examine the resources in the livelihoods of the poor. Singh and Gilman (1999) suggest a complex and diverse set of economic, social and physical strategies as forms of the livelihood systems, which are realised through activities, assets and

¹⁷ Reed and Tharakan, 2004

entitlements by which individuals make a living. The Sustainable Livelihood Analysis (SLA) can be used to explore livelihood systems and can also provide a conceptual framework for developing indicators. A core feature of the framework (Figure 3) is the analysis of the five different types of assets – natural, social, human, physical and financial – upon which individuals rely to build their livelihoods. The SLA identifies vulnerability as central to livelihood strategies. The livelihood strategies at household-level explain and reflect the way of life of humans and their interaction with the environment.

The notion of access to, and control over, environmental related services (water and sanitation, drainage, waste disposal, energy, health services, etc.) by the urban poor should also provide a mechanism for developing poverty-environment monitoring indicators. Therefore the SLA framework is used in the study as a checklist to investigate issues raised in Figures 1 and 2, and presents the main factors affecting people’s livelihoods, and the typical relationships between these factors to achieve sustainability (economic, institutional, social and environmental). The arrows within the framework are used as shorthand to denote the different types of dynamic relationships. None of the arrows imply direct causality, though all imply a certain level of influence. However, the complexity of poverty-environment relationships also presents an obstacle to the development and use of poverty-environment indicators. Ekbom and Bojo (1999) suggest that it is critical to identify and systematically use appropriate indicators to enhance our knowledge. Ideally, these indicators should encompass both poverty and environment and should capture the mechanisms through which they are linked i.e. the transforming structures and processes, especially at micro-economic levels.

Figure 3: Sustainable Livelihoods Framework



Source: Ashley and Carney, 1999

3 RESEARCH METHODOLOGY

3.1 Study Area

The study was carried out in Bonde la Mpunga, an unserviced settlement in Msasani Ward, Kinondoni Municipality, Dar es Salaam. Bonde la Mpunga has many households clustered into hamlets (*vitongoji*) of ten houses, the lowest administrative units. For study purposes, households were randomly selected from existing hamlets. The objective of using the hamlets was to capture data for different social groups by sex, age, socio-economic, education, etc.

3.2 Sampling

At hamlet-level the households were clustered by type of occupancy. The four occupancy categories for dwellings were as follows:

- Owner living with his/her family,
- Owner living with multiple tenants,
- Single tenant living with his/her family, and
- Multi-tenant.

The categorisation was designed to capture the different levels of poverty among community members. For example, normally only the poorest-of-the-poor would rent a single room in a multi-tenant dwelling. A sample frame was used to randomly select representative clusters. A total of 60 households (about 17% of the total households in Bonde la Mpunga), comprising 15 households from each cluster, were visited in the company of key informants. Households in each cluster were randomly selected. Interviews were conducted, in most cases (89%), with the heads of the households sampled.

3.3 Data Collection Procedure

This study used a prepared questionnaire to collect both quantitative and qualitative data, focusing on three variables: resource utilisation, causal links, and the response system to the causal links (see section 3.4). Research assistants collected quantitative data using the questionnaire, while qualitative data was gathered by principal researchers through unstructured interviews with local leaders and key informants. Some open-ended questions were included in the questionnaire. For secondary data, various documents were used as listed in the references section.

3.4 Analysis of Data

After collection, raw data was first sorted, edited, coded and then entered into a computer spreadsheet. Descriptive and inferential statistics were used to analyse the data using MS Excel and SPSS software. Analysed data is presented in tables and graphs for easy interpretation and to enable comparisons and inferences to be drawn. Then the researchers applied the contingency and Gamma correlation coefficients to the study variables to answer the research questions. Both tests are nonparametric for two related dichotomous variables. They test for changes in responses using the chi-square distribution. It is useful for detecting changes in responses due to experimental intervention in "before and after" designs.

3.5 Study Limitations

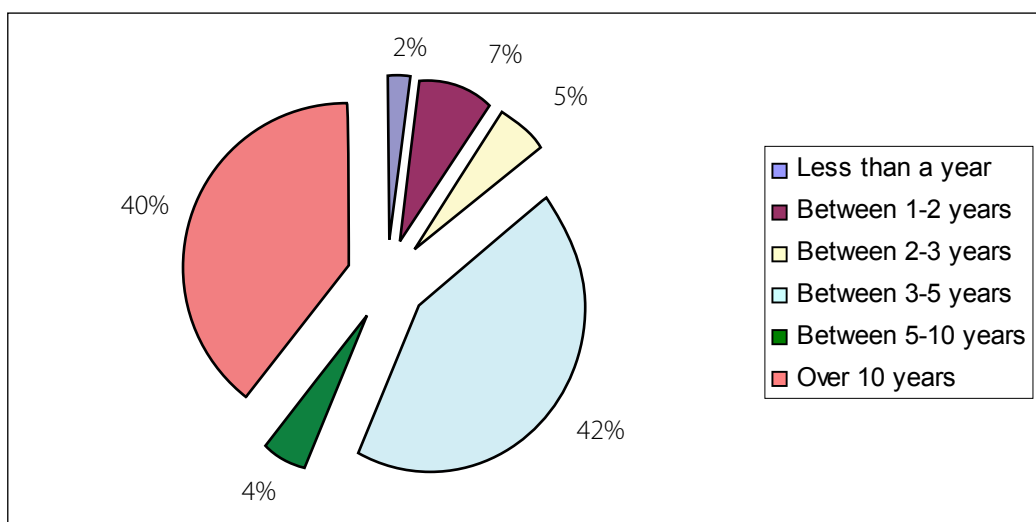
This study like many others encountered various limitations, some of a general nature, and others unique to Bonde la Mpunga. General difficulties included the suspicion of the residents, demands for compensation, and unwillingness to give responses. Problems unique to Bonde la Mpunga were that the area was inaccessible for most of the year, and any community activity was enough to hinder research work. However, to solve these problems researchers used rapport built during previous work to strengthen relationships. Also participants were visited at home under the leadership of the mtaa (street) chairperson, which made the research work much easier.

4 COMMUNITY PROFILE AND POVERTY DIMENSIONS IN BONDE LA MPUNGA

4.1 Community Profile

The findings discussed in this chapter revolve around the duration of respondents' residence in the study area to identify the effects and trends of change, as no documented evidence of changes were available prior to the current study. The information on changes is thus based on interviews with community members who had lived in the area for at least five years. Each respondent represented one household and the selection of the household was based on the length of stay in the area. The authors considered that a five-year period was long enough for significant changes to have occurred that could be described. Many respondents (44% of the 60 respondent households) had been living in Bonde la Mpunga for more than five years. Of these households, 40% had lived there for more than 10 years (see figure 4).

Figure 4: Duration of Respondents' Residence in Bonde la Mpunga



The study also assessed the age of the respondents and the roles of women/men as other factors to validate information gathered from interviews. Most respondents (a total of 68%, comprising 29% between 40 and 50 years, 22% between 50 and 60 years, and 17% above 60 years) who had lived in the area for a long period were over the age of 40 years. Men constituted the largest group (63%). The authors assumed that a 40-year-old person was not only mature, but also responsible enough to notice changes and to reliably describe them.

Another community aspect used for analysis is based on the classification of social groups i.e. the role of men and women in local households, their income generation responsibilities, and participation in environmental management. Results also indicated that 40% of the heads of households in Bonde la Mpunga were women. This is a large noticeable group which needs special attention related to poverty alleviation strategies and environmental knowledge. Women spend much of their time at home involved in different chores not only related to their gender roles but also as heads of households.

4.2 House Ownership

Housing not only provides shelter but is also a productive asset for many urban poor. Resourcefulness in use of housing is particularly important to city residents and was explored further in Bonde la Mpunga. Table 4.1 indicates that 42% of the respondents lived as tenants only and 32% lived tenants with the owner of the house. The implication here is a large proportion of respondents were living in insecure tenancy conditions (eviction threats) which is typical of unplanned urban areas.

The occupancy rate was also another factor to differentiate the poverty levels of households. It is derived from Table 2 that the average households number was found to be between 1-3 (66% of respondents) with a proportionately group (32%) living in single tenant houses (22% owner with family and 10% single rented dwelling). This is a bit surprising, as many studies have associated large families with poverty and overcrowding in terms of occupancy rate, as among the indicators of poverty in urban areas. Other studies (URT, 2002) have shown that almost one third of the households in Dar es Salaam (our study area base) are accommodated in single rooms. The rest of the households (34%) are accommodated in multiple tenant-dwellings. This implies that the dwellings (houses) are crammed with inhabitants. This argument is supported by the fact that 89% of multiple tenant-dwellings hold more than 6 households. The area of rooms of these houses are on average of 3x3m², partitioned to accommodate the family whenever need arises. This is a typical characteristic of an informal settlement, which is associated with overcrowding.

Table 2: Size of Household – Bonde la Mpunga (% of households)

House Ownership	Size of Household (number of occupants)					Total (%)
	1 - 3	4 - 5	6	7	8	
Owner with family	22	2	2	-	-	26
Owner with tenants	17	8	-	2	5	32
Single tenant	10	-	-	-	-	10
Multi- tenant	17	12	-	3	-	32
Total	66	22	2	5	5	100

4.3 Education

Another poverty dimension investigated to capture the effectiveness of livelihood strategies was the level of education of the residents. Data shows that the majority of respondents (58%) were primary school leavers, and nearly one-fifth (19%) had no formal education. The rest (33%) had education above primary level, of which 2% had a university level of education. Of the educated respondents, women constituted only 27%.

The status of education among Bonde la Mpunga community members was found to be due to poverty and the inadequate education facilities in the area (quantity, quality and accessibility). There was only one nursery and one primary school in Bonde la Mpunga to cater for more than 300 households. In addition, there was neither a secondary school nor a vocational training centre that could provide primary school leavers with different trades and skills. Even if more schools existed, very few people from Bonde la Mpunga could afford to take their children to school. The implication here is that people of a low level of education inhabit Bonde la Mpunga, a place where they could easily earn a living.

4.4 Income Generating Activities

To examine the link between poverty and income, data was collected on income-generating activities in which Bonde la Mpunga community members were engaged. Like many unplanned areas of Dar es Salaam, people moved to Bonde la Mpunga to cultivate rice, so as to supplement their meagre salaries. However, over time, pieces of farms were converted into plots, and dwellings erected, thereby turning livelihoods from farming to renting houses/units. With these changes, petty trade (41%) now constitutes the major livelihood activity in the area, followed by formal employment (36%) as shown in Table 3.

Table 3: Occupation by Type of Dwelling

Type of Dwelling	Occupation							Total (%)
	Employee	Dependant	Trade	Small Enterprises	Petty Trade	Nutrition	Animal Husbandry	
Owner with family	15	2	3	-	7	-	-	27
Owner with tenants	12	-	7	-	10	-	3	32
Single rent	7	-	-	-	3	-	-	10
Multi-rent	2	-	3	2	21	3	-	31
Total	36	2	13	2	41	3	3	100

Correlating income-generating activities to length of stay, the statistics indicate that 100% of newcomers (i.e. residency of less than 2 years) to the area were engaged in petty trade. However, community members who had lived in the area for longer than 5 years, constituted a proportionally large group of those employed (24%). This was considered unique to Bonde la Mpunga. One of the old timers had the following to say:

“When I moved here, before independence, there was plenty of fish catches and paddy yields and we got enough money to build houses. But what is of now! If you look around there are many fishermen because the paddy farms have been turned into housing plots, such that there is no space for recreational activities or where our children can play around. I get 7,000/= per month from house rent per each of the 6 tenants. My daily expenses on basic necessities is about 4,000/=, how can you cope up with life.”

This quote supports reactions from other old members of the community, many of whom earned a living by working at night as watchmen and house attendants in the nearby wealthy areas of Msasani and Oysterbay to supplement their house rent collection. However, the low level of education in the area makes it difficult for community members to secure good formal employment or engage in high value informal employment. Some of the old timers were engaged in tailoring on old-fashioned Singer sewing machines, which were worn out.

An interesting aspect concerning household income-generating activity was the engagement in animal husbandry (Table 4). Although the data for this activity was proportionally small (3%), it was being carried out by landlords (100%), and specifically female ones. This activity complemented other income-generating activities, and in some households it was the main activity as many of these dwellings were used as business premises. However, the tenants were prohibited from doing the same. Otherwise the main occupation for those living as single households tenants (most of them being the owners) is employment and rent collection.

Table 4: Occupation by Gender

	Occupation							Total (%)
	Formal Employment	Dependant	Trade	Small Enterprises	Petty Trade	Nutrition	Animal Husbandry	
Female	2	2	5	-	27	3	3	42
Male	34	-	8	2	14	-	-	58
Total	36	2	13	2	41	3	3	100

Considering the types of livelihoods in the area from a gender perspective, data showed that the majority of women heading households (64%) were engaged in petty trade. Again the main reasons for this choice of livelihood were the low level of education of respondents, and because the nature and type of businesses, e.g., preparing and selling of food, animal husbandry (such as poultry keeping), etc., blended well with household chores. An old lady who had been living in the area since she moved to Dar es Salaam before independence had this to say:

"My son, I am not employed and had never been employed. I make a living from making local brew, which has never given me enough money to feed myself and the two dependants [she did not reveal the relationship]. Sometimes I go without a meal, at times capital to buy the local brew ingredients I do not get!"

4.5 Social Relations

Studies have shown that higher income or wealthier households are better off, and able to withstand environmental changes than poor households¹⁸. While wealthier households are able to withstand environmental changes individually, the poor rely on community initiatives. This fact was also investigated in Bonde la Mpunga in the context of social capital. The findings of the study showed that 89% of community members strongly interacted with each other. Interaction was mainly for the purpose of supplementing meagre income derived from household livelihood activities. Old timers in the area confirmed this social cohesion as typical in African culture and were happy that it had not been eroded with time.

Social interactions extended beyond supporting kin and blood relations, and covered other areas, such as community work. Most community members (75%) asserted that they had participated, and/or were ready to participate in community initiatives. However, only a few respondents (23%) fully engaged in community work, and most of this group (98%) were landlords. New members in the community and non-house owners were unwilling do so. Thus, although Bonde la Mpunga community members had strong family ties and interacted more to meet different social needs, which in most cases they would not be able to meet individually, there was very little initiative for community work. The main reason for participation was land ownership.

4.6 Synthesis of Poverty Findings

The majority of respondents (61%) associated poverty with low income (Table 5). 44% of the respondents were members of the community who have lived in the area for longer than 5 years, which accounts to about 87% of the respondents in this study. Nearly one-third of respondents

¹⁸ Ellis, 1988

(32%) perceived poverty as a lack of basic needs, while a few respondents perceived poverty as lack of development initiatives or due to having nothing to support basic needs (5% and 2% respectively).

Table 5: Poverty Perception - Bonde la Mpunga (% of Respondents)

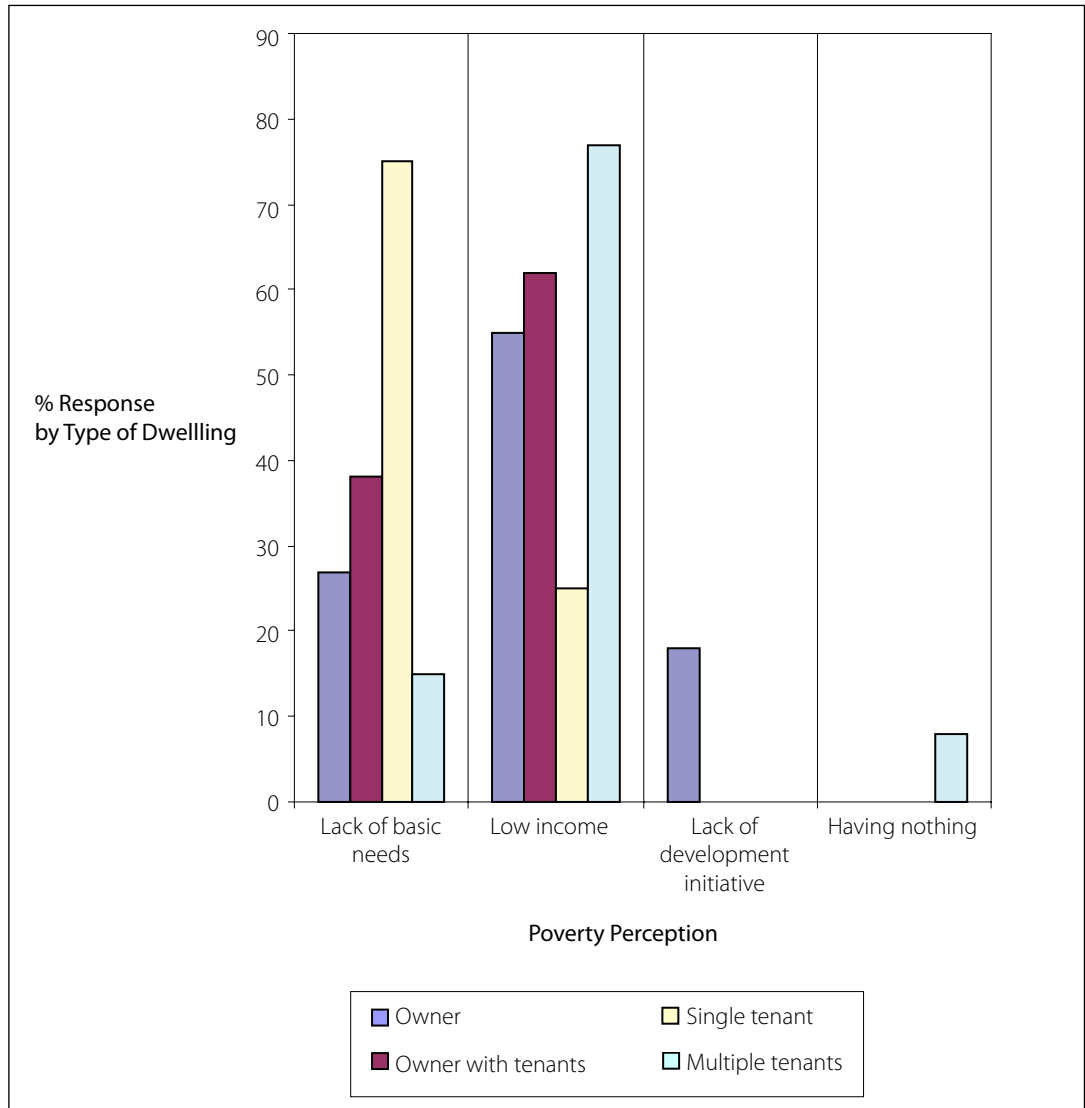
Length of Stay (years)	Poverty Perceptions				Total %
	Lack of Basic Needs	Low Income	Lack of Development Initiatives	Having Nothing to Support Needs	
Less than 1 year	-	2	-	-	2
1 - 2 years	5	2	-	-	7
2 - 3 years	2	3	-	-	5
3 - 5 years	20	15	5	2	42
5 - 10 years	-	5	-	-	5
More than 10 years	5	34	-	-	39
Total	32	61	5	2	100

In addition to the perceptions of poverty presented in the table, which were derived from literature, respondents had their own perceptions of poverty as follows:

- poverty is hardships because people don't have money;
- poverty is lack of basic infrastructure, especially roads, to ease movement in search of livelihood sources;
- poverty is having no money to finance personal development projects;
- poverty is a tendency for idleness; and
- poverty is a lack of appropriate education to enable one to make a reasonable living.

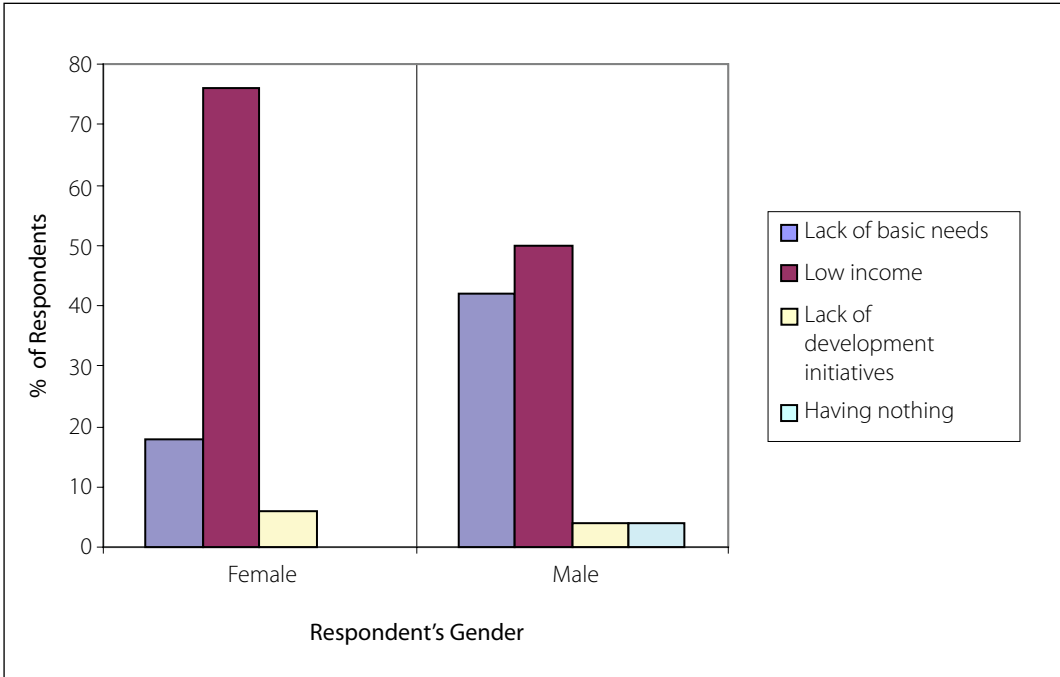
Data on the different perceptions of poverty from respondents in the study area, that have a potential relationship with the environment are depicted in Figure 1 and analysed below. Classifying poverty status by dwelling characteristics shows that better off households (house owners) perceived poverty as lack of development initiatives. In contrast, the most poor (multiple tenants) perceived poverty as low income and having nothing to support a living (Figure 5). Other respondents perceived poverty as lack of basic needs and low income.

Figure 5: Poverty-Environment Community Perception



Further interpretation of poverty perceptions by sex showed that 76% of females and 50% of male respondents associated poverty with low income (see Figure 6). The implication here is that poverty due to low income predominantly affected women. This is a cultural phenomenon whereby women do not own livelihood assets. This difference in perception supports other studies that have shown that women are still an underprivileged group in terms of income generation.

Figure 6: Perception of Poverty by Gender



The figure also shows that a large proportion of men perceived poverty as a lack of basic needs, a social service factor. In contrast, a minority of women acknowledged a lack of development initiatives because they were excluded from asset ownership. From these perceptions of community members in Bonde la Mpunga, the authors gained the impression that poverty in Bonde la Mpunga was compounded by factors other than income, which adversely affected the womenfolk.

5. ENVIRONMENTAL ISSUES IN BONDE LA MPUNGA COMMUNITY

5.1 Land Use

It was derived from the analysis above that income generation was dependent on dwelling characteristics, which in turn was a function of owning a house or a piece of land. Many economic activities in the community were taking place anywhere there was a space, be it on the streets or on house verandas. Quoting from one landlord respondent:

"I built this house before independence (1961), and now it is my major source of livelihood. I would not want it to deteriorate at all. I would like to move to another area where there is space as people have encroached on me because of uncontrolled developments."

Based on this finding, the relationship was explored further focusing on land use. Land ownership as a source of income (rent) had led to unplanned development and land use conflicts, as contended by long timers (20%) in the area. However, it was interesting that the majority of respondents did not acknowledge existence of land use conflicts. For those who did positively respond, 37% attributed land use conflicts to unsurveyed plots, while 32% attributed conflicts to unplanned development. The rest the respondents (31%) had no comment on this issue.

5.2 Water Supply and Sanitation

None of the dwellings in Bonde la Mpunga was connected to a sewage system. The study identified four types of toilets systems used in Bonde la Mpunga: water flush (5%), water splash (11%), VIP (ventilated improved pit) latrine (2%), and traditional pit latrine (82%). Because of the high crowding, the type of toilets preferred in dwellings were the traditional pit latrines. This was attributed to the ease of cleaning in view of the number of users and the scarce availability of water for flush water toilets. However, the pit latrines used were commonly shallow and filled up in a short time because of the large number of users per toilet – on average 18 people, i.e., 6 households of 3 people per dwelling (normally each dwelling has one pit latrine toilet because of space). When it rains the latrines become filled with water and waste flows into natural drainage and on to the streets contaminating the environment and polluting the water supply system.

All respondents said they used piped water but supply was interrupted with an average of two weeks' shortage a month. During interrupted water supply, either they had to use stored water or resort to other supplies including shallow wells. The piped water was invariably connected with a few respondents having taps in-house. Two-thirds (67%) of the dwellings surveyed that had taps connected in-house had landlords living in the houses. Those having no in-house water supply travelled distances between 1 metre and 100 metres to the nearest water tap, either a public tap, or a neighbour's tap, for a fee which ranged from 20 Tsh to 50 Tsh per 20 litre bucket. Thus, the cost averaged from 1,500 Tsh to 20,000 Tsh a month, depending on water availability, household size, and water usage.

Although data showed that all households in Bonde la Mpunga had access to tap water, this water was not considered safe for drinking purposes. This view was justified because supply pipes were underground, and the water was heavily polluted due to common use of traditional pit latrines and to indiscriminate waste disposal. Another factor relevant to the poor quality of drinking water was

that households in Bonde la Mpunga resorted to sources of water of poor quality such as shallow wells and streams due to the erratic availability and the cost of official water supply systems. Other studies have also shown that the proportion of households using treated water has fallen in Dar es Salaam¹⁹ principally due to continued degradation of the environment by overpopulation and scarce resources available to the city authority.

5.3 Waste Disposal and Drainage

Bonde la Mpunga does not have a dumping area or a drainage system. The common disposal sites identified by the respondents and observed by researchers were ‘anywhere outside the dwelling’ (42%) and ‘anywhere inside the dwelling’ (25%) (see Table 6). A few dwellings had waste containers outside (19%) or open pits inside the dwellings (7%). The rest of the dwellings burnt solid waste. The main reasons for these solid waste disposal methods were the absence of a dumping site, high waste collection fees, and possibly cultural tendencies. One respondent, when queried about indiscriminate waste disposal, showed surprise, and asked, “*What is the problem?*” In other dwellings respondents said that they would find waste at their doorsteps.

Table 6: Solid Waste Disposal – Bonde la Mpunga

Type of Dwelling	Type of Disposal Method						Total (%)
	Open Pit Inside Dwelling	Container Outside Dwelling	Anywhere Outside Dwelling	Anywhere Inside Dwelling	Burning	No Answer	
Owner	5	2	10	10	-	-	27
Owner with tenants	-	12	5	10	3	2	32
Single tenant	-	-	10	-	-	-	10
Multi-tenant	2	5	17	5	2	-	31
Total	7	19	42	25	5	2	100

Waste disposal methods and the tendency for indiscriminate dumping were further analysed in relation to dwelling characteristics for correlation purposes. Analysis of data indicates that the majority of multi-tenant dwellings without landlords (53%) disposed solid waste anywhere outside the dwelling, as did single tenants households (100%). For dwellings with landlords in residence, only 5% disposed of waste anywhere outside the dwelling. This difference could be attributed to the fact that landlords staying with tenants are interested to protect their houses and attract more tenants. The major disposal sites for solid waste for owners living with their families were the river basin, open pits, and potholes along the streets.

Liquid waste was disposed anywhere outside, inside yards, or in natural drainages (Table 7). The houses have been built in such a way that it is virtually impossible to provide waste collection services, such as cesspit-emptying trucks, due to narrow access streets, and the lack of a sewage system. There is virtually no man-made drainage in Bonde la Mpunga. Rainwater and human liquid waste is discharged into streams and onto streets. Liquid waste disposal methods analysed by social group, revealed that those who discharged waste into natural drainage systems were owners living with their families

¹⁹ URT, 2002

(15%) and multi-tenant dwellings (14%). For the owners, the main reason for using this method was that they could afford to lay down drainage from their houses to the nearest natural drainage.

Table 7: Liquid Waste Disposal – Bonde la Mpunga

Type of Dwelling	Type of Liquid Disposal Method					Total (%)
	Natural Drainage System	Cesspit	Anywhere In/Outside Dwelling	'Chooni' (in the toilet)	No Answer	
Owner	15	7	5	-	-	27
Owner with tenants	10	7	10	3	2	32
Single tenant	-	3	7	-	-	10
Multi-tenant	14	7	7	3	-	31
Total	39	24	29	6	2	100

5.4 Health Services

At the time of the study, Bonde la Mpunga had one medical laboratory, a number of drug stores, one dispensary and a hospital (TMJ). All of these facilities are privately owned. However, 82% of respondents contend that the availability of the medical services was restricted by the high consultancy fees and drug prices. The respondents also expressed concerns about the quality and corruption of services rendered by public health institutions. Table 8 records respondents' perceptions on the quality of health services provided in Bonde la Mpunga. Results show that 22% of women perceived medical services to be very good compared to 7% of men. This perception was pursued to understand the gender impact of poverty-environment interactions.

Table 8: Perception of Quality of Medical Services by Gender

	Quality						Total (%)
	Very Good	Good	Satisfactory	Poor	Very Poor	No Answer	
Female	22	17	-	-	-	2	41
Male	7	12	22	12	3	3	59
Total	29	29	22	12	3	5	100

Women are more subjected to local environmental conditions than men, by virtue of spending longer periods at home, and urban poor women have no option but to seek medical services that are around the corner. Women's daily chores leave them with virtually no extra time to explore and compare other medical services. The fact that their livelihoods only just meet basic needs makes the choice of better alternatives a luxury.

5.5 Synthesis of Findings on Environmental Problems

Environmental degradation was perceived by most community members to be related to air pollution (Table 9). This perception could not have been predicted from other documented studies of communities similar to Bonde la Mpunga. Possible explanations are that respondents noted the filthy stench that arose from rotting garbage indiscriminately disposed of, or that discharged wastes were perceived by the community to be the main aspect of air pollution. Quoting from one of the respondents:

“Everywhere around you there is rotting debris emitting stench especially during the rainy season. It is a pathetic condition here I tell you.”

This was also supported by the substantial proportions of responses, which associated environmental degradation with waste disposal (10%) and land grabbing (10%).

Table 9: Environmental Degradation Perception by Length of Stay

Length of Stay (years)	Environmental Degradation Perceptions						Total (%)
	Air Pollution	Poor Drainage	Waste Disposal Problems	House Congestion	All Stated Perceptions	No Answer	
Less than 1 year	2	-	-	-	-	-	2
1 -2 years	5	-	-	-	2	-	7
2 - 3 years	2	-	3	-	-	-	5
3 - 5 years	32	-	3	2	5	-	42
5 - 10 years	3	2	-	-	-	-	5
More than 10 years	10	13	14	-	-	2	39
Total	54	15	20	2	7	2	100

The major causes of the environmental problems identified by residents included: overcrowding (unplanned housing), which created a difficult situation for waste disposal and sanitation (49%); poverty (29%) and generated waste (17%) (see Table 10).

Table 10: Type and Causes of Environmental Degradation – Bonde la Mpunga

Type of Environmental Degradation	Cause of Environmental Degradation			
	Generated Waste	Overcrowding	Poverty (unaffordable user fees)	No Answer
Air pollution	10	24	17	3
Poor drainage	-	15	-	-
Waste disposal problems	2	10	8	-
House congestion	-	-	2	-
All together	5	-	2	2
Total	17	49	29	5

Where facilities were available, the associated user fees were not affordable for women (who deal with waste disposal). The average user fee was around 1,500 Tsh per month compared to the average monthly income of residents of 15,000 Tsh. Based on the findings above, each cause of environmental degradation was explored and correlated with changes to livelihood activities in Bonde la Mpunga.

6. SYNTHESIS OF POVERTY-ENVIRONMENT INTERACTION IN BONDE LA MPUNGA

6.1 Poverty Environment Linkage

The findings and the synthesis in previous sections shows that the relationship between poverty and environment in Bonde la Mpunga depends significantly on the ability of landowners to manage their houses and the surrounding environment. Bonda la Mpunga was characterised by uncontrolled land use leading to unplanned housing development, indiscriminate waste disposal due to the lack/ inadequacy of environmental services, and uncontrolled income-generating activities. The findings are summarised in Table 11.

Table 11: Relationships Between Poverty and Environment in Bonde la Mpunga

Poverty Issue	Manifestation	Relation to Environmental Factors	Poverty-Environment Indicator(s)
Income	<ul style="list-style-type: none"> <input type="checkbox"/> Inability to afford adequate housing <input type="checkbox"/> Inability to access credit for business 	<ul style="list-style-type: none"> <input type="checkbox"/> Access to land <ul style="list-style-type: none"> • Tenure insecurity • Land development regulations and controls 	<ul style="list-style-type: none"> <input type="checkbox"/> A small proportion (¼) of community members own land/plots <input type="checkbox"/> 64% are living in crowded condition <input type="checkbox"/> Housing density is very high <input type="checkbox"/> Crowding per dwelling is very high
Health	<ul style="list-style-type: none"> <input type="checkbox"/> Devastating and lasting drain on household resources 	<ul style="list-style-type: none"> <input type="checkbox"/> Environmental conditions of housing and neighbourhood <ul style="list-style-type: none"> • Cleanliness (adequate sanitation and drainage) • Availability of safe and clean drinking water • Availability of waste disposal services/ facilities 	<ul style="list-style-type: none"> <input type="checkbox"/> Impact of environmentally related diseases (malaria 80%; respiratory 7%; and waterborne 13 %) <input type="checkbox"/> 45% of household income spent on health services <input type="checkbox"/> Small proportion (less than ¼) of waste is collected/disposed safely <input type="checkbox"/> ½ of the community members have access to poor quality drinking water <input type="checkbox"/> 82% of dwellings have poor sanitation facilities
Education	<ul style="list-style-type: none"> <input type="checkbox"/> Inability to have regular job <input type="checkbox"/> Poor environmental management practices <input type="checkbox"/> Limited economic opportunities <input type="checkbox"/> Low income <input type="checkbox"/> Poor health 	<ul style="list-style-type: none"> <input type="checkbox"/> Environmental health issues <input type="checkbox"/> Vulnerability to disasters and flooding 	<ul style="list-style-type: none"> <input type="checkbox"/> A large proportion (¾) of the community has low level of education <input type="checkbox"/> ½ of community members have formal employment

Empowerment	<input type="checkbox"/> Access to land	<input type="checkbox"/> Ability to decided how to use environmental related services (water supply and sanitation, waste disposal)	<input type="checkbox"/> Inadequate technical (7%) and financial (5%) support from local government
	<input type="checkbox"/> Access to environmental related services	<input type="checkbox"/> Availability of adequate environmental related services	
	<ul style="list-style-type: none"> • Water supply • Sanitation • Waste disposal 	<input type="checkbox"/> Unaffordable user fees of facilities where available	

6.2 Environment and Income-Generating Activities

Like many unplanned areas of Dar es Salaam, people moved into Bonde la Mpunga to cultivate rice to supplement their meagre salaries. However, over time, pieces of farms have been converted into plots, and dwellings erected, thereby turning livelihoods from farming to rent. With these changes, petty trade (41%) now constitutes the major activity in the area. Analysis of data pertaining to petty trade showed that these activities were carried out along the streets and on house verandas.

The analysis of economic activities taking place in the area shows a causal relationship with the environmental problems identified in Bonde la Mpunga (Table 12). Based on the identified environmental problems (Table 9) further analysis was made on contribution of each economic activity to the environmental problems. The results indicated that petty trading was the major contributor to the environmental problems as follows: land pollution (75%); air pollution (77%); poor drainage (83%); waste disposal problems (75%); and housing congestion (100%). Assuming this relationship, the Gamma coefficient of correlation was calculated as 0.282, which though a relatively weak relationship is worth noting for its significance on health.

Table 12: Economic Activities in Bonda la Mpunga - Environmental Problem Linkage

Main Economic Activities in Bonda la Mpunga	Defining Environmental Degradation						
	Land Pollution	Air Pollution	Poor Drainage	Waste Disposal Problems	House Congestion	All Together	No Answer
Small Enterprises	-	14	-	-	-	33	-
Petty Trading	75	77	83	75	100	67	-
Trade	25	-	-	-	-	-	-
No Answer	-	9	17	25	-	-	100

Petty trading activities included: preparation and sale of food, beer, liquor, vegetables, other produce from home gardens and community property resources, and scavenged items. Income from these activities was seasonal and depended very much on the state of the environment. During the rainy season, the area would be flooded to an extent that most petty trading activities would be suspended except for those being carried out on house verandas.

Another major source of livelihoods was house ownership. Income was earned either from rent, or by turning the house into a business premise, which was identified as the major cause of house congestion and land use conflicts, as contended by long timers in the area. The existence of land use conflicts implies that land ownership in urban areas is highly valued and landlords ensure that

ownership is limited to a small proportion of residents, especially indigenous residents and/or long timers in informal settlements like our study area. Land grabbing was primarily for speculation; buildings were erected or the land was sold to realise capital. One respondent said:

“Being powerless and poor, we are forced to sell pieces of land for additional income.”

But this has created conditions ripe for land use conflicts due to illegal land demarcations. On the other hand newcomers said:

“We grab and occupy (illegally and sometimes semi-illegally) land for building houses.”

This was done despite the fact that both groups, landlords and newcomers, were aware of eviction threats, but they insisted that they had no other choice.

Therefore, a significant relationship can be deduced between income of the poor in urban areas and land ownership, which creates other related poverty-environment outcomes such as house congestion, which in turn makes it difficult for environmental related services to be provided (e.g., drainage and solid waste disposal). In other words, the urban poor in their struggle to make a living from land ownership create additional pressures on the already fragile environment out of necessity and for survival.

6.3 Environment and Health

Environmental problems, such as indiscriminate waste disposal, and the poor quality of drinking water and sanitation facilities were shown to be major causes of the health problems in the area. Common diseases in the area such as malaria (78%), which is a vector disease, and waterborne diseases (13%) were associated with the degraded environment (Table 13). Respiratory diseases, such as asthma, flu, etc., were also common. The prevalence of these diseases, particularly malaria, can be explained by the fact that the area is water logged throughout the year. The fact that the costs of medical services are unaffordable to the residents of Bonde la Mpunga makes their health situation even worse.

Table 13: Environmental Impacts and Related Diseases – Bonde la Mpunga

Environmental Impact	Disease				Total (%)
	Respiratory	Waterborne	Cholera	Malaria	
Environmental Pollution	5	5	5	78	93
High Health Costs	-	3	-	2	5
Environmental Degradation	2	-	-	-	2
Total	7	8	5	80	100

The correlation between identified environmental problems and prevalence of diseases in the area indicated a strong relationship. The calculated Gamma coefficient of 0.434 at an approximate significance level of 0.164 suggests a relatively strong relationship between the two variables. Table 14 shows that while poor drainage accounts for 66% cases of malaria, land degradation accounts for 67% cases of acute respiratory infections. House congestion (77%) and land pollution (23%) were found to be the major factors in the spread of cholera. Land pollution is attributed to indiscriminate waste disposal, which is caused by the extreme lack of disposal sites and services. The health status of the community is further aggravated by polluted drinking water from both piped and underground sources.

Table 14: Environmental Problems Impacts on Health

Environmental Problems	Incidence of Diseases				
	Acute Respiratory Infections	Cholera	Diarrhoea	Pneumonia	Malaria
Land pollution	-	23	-	-	9
Air pollution	67	-	-	100	-
Poor drainage	-	-	50	-	66
Waste disposal problems	-	-	-	-	12
Housing congestion	33	77	-	-	3
All together	-	-	50	-	6
No Answer	-	-	-	-	3

6.4 Environment and Education

Given the fact that women are a proportionally large group of household heads, their low level of education may have adverse impacts on livelihood strategies and environmental management in Bonda la Mpunga. This is because Tanzanian women in general, and particularly those living in the study area, were responsible for activities directly linked to environmental management at the household level (e.g., cleaning, waste collection and disposal, etc.). Thus, adequate environmental education was needed to distinguish the different types of waste for safe and effective disposal.

Analysis of the relationship between level of education and environmental problems in the study area showed a causal relationship (Table 15). Perceptions of environmental problems varied across different levels of education. Respondents with primary level education considered that environmental problems were caused by poor drainage. This in part reflects the kinds of income-generating activities of community members. Petty traders did not perceive waste disposal as an environmental problem. One respondent said:

“What is the problem! This waste will rot or be washed away when it rains.”

The Gamma coefficient is calculated to 0.350 at a significance level of 0.075, which indicates a relatively strong relationship between the level of education and environmental management practices.

Table 15: Level of Education – Environmental Problems Relationship

Level of Education	Defining Environmental Degradation						
	Land Pollution	Air Pollution	Poor Drainage	Waste Disposal Problems	Housing Congestion	All Together	No Answer
No Education	25	23	17	25	-	-	-
Primary	75	55	83	50	-	33	-
Secondary	-	14	-	-	100	67	100
Certificate	-	9	-	-	-	-	-
Post Secondary	-	-	-	25	-	-	-

6.5 Environment and Security

Insecurity is one dimension of poverty related to inequality in opportunities, income and access to services. Bonde la Mpunga was perceived by a majority of respondents (56%) to be very safe. However, almost one-quarter (24%) found the area insecure during the day, and 27% felt it was insecure during the night.

Many of the criminal acts committed were said to be petty thefts and pick-pocketing reflecting socio-economic changes. When residents were asked why they were still living in the area despite all the identified problems, long time members (44%) said they stayed to generate income from house rent and speculation on land values. For newcomers (13%), continued living in the area was due to economic reasons, i.e., affordability and easy access to basic needs (food, shelter, water, transport, etc.). The only degree holder in the area, who had just moved in, had this to say:

"After my university education, I worked with a construction company, but now I am not working there and find this place accommodative because of the low rent. In other areas you have to part with a year's rent on top of the high rent value itself".

Table 16: Continued Living in the Area - Bonde la Mpunga

Length of Stay (years)	Do You Like Living in the Area?		Total (%)
	Yes	No	
Less than 1 year	2	-	2
1 - 2 years	-	7	7
2 - 3 years	5	-	5
3 - 5 years	29	13	42
5 - 10 years	-	5	5
More than 10 years	10	29	39
Total	46	54	100

Although 100% of the longest serving community members (40% of the respondents have lived over 10 years) were still living in the area, they would wish to move from Bonda la Mpunga if they could get and afford new plots. Few, if any of the singles (who are the present day generation) would want to live in the area.

6.6 Local Government Support

In light of research findings discussed in the previous sections, the role and actions of local government are now discussed. One respondent had this to say:

"We have complained to the authority about flooding of the area because the natural drainage was blocked by a rich man's building erected in its middle. No actions have been taken so far and the building is now complete. Come this rainy season we don't know what would be of our fate!"

This quote reflects the feelings of the majority of community members about the reluctance of the local authority to provide basic environmental related services (water and sewage, solid waste disposal, drainage, disease vector control, etc.). As the area is an informal settlement, environmental related services rarely attract the attention of local government. As most respondents said,

“If you see a ‘tingatinga’ (road grader) here either a senior government official is visiting the area or it’s the civil election period or Mwenge” [UHURU Torch].

The same situation was found in the provision of water (Table 17).

Table 17: Actions by Local Government to Improve Water Supply

Length of Stay (years)	Actions by Local Government				Total (%)
	Shallow and Deep Wells Increased	Financial Support	No Plans	Did Not Know	
Less than 1 year	-	-	2	-	2
1 - 2 years	-	-	5	2	7
2 - 3 years	-	2	-	3	5
3 - 5 years	7	3	17	15	42
5 - 10 years	-	-	-	5	5
More than 10 years	-	-	-	39	39
Total	7	5	24	64	100

Data in Table 17 indicates that 64% of the community members in Bonde la Mpunga did not know whether there were any plans to improve water supply system in the area. Of the 64%, 39% were the long-term residents of the area. This stresses the fact that environmental related services continue to receive little attention from local government authorities in unplanned settlements. When respondents were asked about the contribution of local government to alleviate environmental problems, the majority did not have an answer to the question. The main reason for this may be the absence of a participatory planning system for solving inherent community problems. Analysis of data from the few respondents who answered this question (36%), shows that a lack of technical support accounts for 14% of air pollution, and a lack of financial support accounts for 25% of problems of land degradation in the area (Table 18). The same data shows that lack of financial support accounts for 33% of the environmental problems of Bonde la Mpunga.

Table 18: Role of Local Government

Local Government Support	Environmental Problem						
	Land Degradation	Air Pollution	Poor Drainage	Waste Disposal Problems	Unplanned Housing	All Together	No Answer
Technical	-	14	-	-	-	-	-
Financial	25	-	-	-	-	33	-
No Plans	-	41	-	-	-	33	-
No Answer	75	45	100	100	100	33	100

6.7 Synthesis of Poverty-Environment Interaction

The analysis of community perceptions of poverty-environment interactions was based on the categorization of community members provided in section 3.2. It can be deduced that there were

significant differences in the perception of environmental problems between the wealthy group of the community members (represented by landlords) and the poor (represented by tenants). While air pollution was an environmental problem for respondents in multi-tenant dwellings (41%), wealthy residents (100% composed of landlords living with their families) considered the environmental problem to be unplanned housing. For landlords living with tenants, the environmental problem was land pollution as a result of indiscriminate waste disposal, compounded by poor drainage. The implication is that there is a relationship between the level of poverty and perceptions of environmental degradation. A contingency coefficient for the association between the two variables was calculated to 0.531 indicating that the association is strong.

Table 19: Poverty-environmental Relationship in Bonde la Mpunga

Community Perception of Poverty	Community Perception of Environmental Degradation (%)				
	Air Pollution	Poor Drainage	Waste Disposal Problems	House Congestion	All Together
Lack of basic needs	77	0	8	0	16
Low income	48	24	24	0	4
Lack of development initiatives	0	0	50	50	0
Having nothing	0	0	0	0	100
Total	54	15	20	2	9

It can be inferred, from the analysis above, that one of the key poverty-environment indicators in an urban setting is the availability of land, which is considered essential life to support the livelihoods of urban residents. The situation in the study area was made worse by unchecked petty trading which had occupied all optimal locations, including the narrow streets that provided access to the congested houses. The other negative consequence of petty trading, though a major source of livelihood for the majority of the community members in Bonde la Mpunga, was the indiscriminate dumping of wastes leading to environmental pollution. From this synthesis of poverty-environment interaction pertaining to Bonde la Mpunga we can draw a poverty-environment linkage for urban areas with similar characteristics as follows:

- Unplanned and congested houses leading to overcrowding and the scramble for land and environmental related services (water supply and waste disposal);
- Lack of environmental controls and regulations leading to poor environmental management practices with devastating impacts on health; and
- Absence of gender empowerment (lack of education and participatory institutional set ups).

The issue of land use in unsurveyed urban areas can be linked to unplanned development. Uncontrolled land demarcations create the environment for expansion of unplanned settlements, inadequate environmental related services, and uncoordinated service delivery efforts by individual developers. Lack of housing policy in these areas not only contributed to uncontrolled housing development and house congestion, and a poor health environment, but also created conditions that made it difficult to improve even the few available environmental services. This poverty-environment interaction suggests a set of generic indicators specific to urban areas leading to a heavily degraded environment, normally found in squatter and unserviced settlements (Table 20).

Table 20: Urban Poverty – Environmental Monitoring Indicators

Poverty Issue	Environmental Issue	Intermediate Indicator	Impact Indicator	Response Factors
Income	<input type="checkbox"/> Access to and use of land	<ul style="list-style-type: none"> • Squatter formation • Unplanned development • Insecurity of tenure 	<ul style="list-style-type: none"> • % population living on hazardous land • High housing density • Proportion of population engaged in urban agriculture 	<ul style="list-style-type: none"> • Participatory land development regulations and controls • Community-based upgrading of informal settlements • Land tenure
Health	<input type="checkbox"/> Environmental conditions of housing and neighbourhood <ul style="list-style-type: none"> • Cleanliness (adequate sanitation and drainage) • Availability of safe and clean drinking water • Availability of waste disposal services/ facilities 	<ul style="list-style-type: none"> • Access to safe and clean water • Quality of sanitation facilities • Availability of waste disposal facilities 	<ul style="list-style-type: none"> • Prevalence of environmental related diseases • Prevalence of death • % population with access to environmental related services • Pollution levels 	<ul style="list-style-type: none"> • Increased access to environmental related services • Community-based environmental management initiatives • Strengthened community governance of use of environmental related services with gender perspective
Education	<input type="checkbox"/> Environmental health issues	<ul style="list-style-type: none"> • Existence of environmental education programmes • Community participation in environmental related initiatives and issues 	<ul style="list-style-type: none"> • Prevalence of environmental related diseases • Proportion of waste collection • Environmental cleanliness and human excreta disposal 	<ul style="list-style-type: none"> • Extent of women’s involvement in environmental management decision-making • Support from the local authority in environmental information
Vulnerability	<input type="checkbox"/> Vulnerability to disasters and flooding	<ul style="list-style-type: none"> • Land availability • Land landlordship • Disaster preparedness • Security 	<ul style="list-style-type: none"> • Population in unauthorised housing • Population living in precarious zones • Scope of disaster prevention/ mitigation measures • Access to police and legal system • Crime rate • HIV/AIDS prevalence • Primary school drop outs rate • Teenage pregnancies rate 	<ul style="list-style-type: none"> • Creation of informal institutions and governing bodies for disaster preparedness • Policy coherence across administrative scales for urban management • Building partnerships amongst stakeholders (Public, private, and civil societies)

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

Although most kinds of poverty-environment interactions and resulting livelihood activities in urban areas arise from inadequate levels of service provision and insecurity of tenure, the need shelter remains the highest priority for poor urban residents. Bonde la Mpunga is close to the central business district and is cheap to afford, and for these reasons, continues to attract poor residents as well as rural migrants who do not have reliable source of livelihoods but the social capital. This supports other studies, which have established that urban areas provide a variety of opportunities for earning income²⁰.

However, the demand for shelter, as noted in Bonde la Mpunga, leads to uncontrolled and unguided development, reflected in house congestion. This was found to have an adverse impact on environmental conditions in the study area. Some identified problems were poor service delivery in terms of water supply and sanitation and waste disposal. Land is important for the provision of collection and disposal sites as well as for access to waste collection facilities. Land grabbing and uncontrolled housing developments also means that the limited environmental related services (water supply, sanitation and waste disposal) cannot be improved unless a resettlement scheme is initiated. In absence of such schemes, other poverty-environment related problems emerge, such as the absence or lack of basic physical infrastructure, characterised by indiscriminate waste disposal and unplanned built environments. The situation is made worse by a limited sense of responsibility from community members, the majority of whom are tenants. Such problems continue stressing the environment and the vulnerability of residents worsens.

Despite the poor environmental conditions in Bonde la Mpunga, at both community and household levels, residents have developed strategies to cope and earn a living there. One strategy in Bonde la Mpunga relates to the type of house built in the area. Houses in Bonde la Mpunga are cheaply constructed so as to be easily acquired (afforded) by urban poor. Houses are cheaply built because land acquisition, which includes land grabbing, does not go through the bureaucracy like surveyed plots, and because insecure tenure discourages landlords from investing to improve their land and services. This is dangerous because environmental shocks, such as floods may destroy life, health and possessions directly, but also further compound environmental problems and health hazards (e.g. what happened recently in Bonde la Mpunga following the heavy rains in January 2005). It was also established that the majority of the residents in Bonde la Mpunga depended on petty trade for a living, which was carried out around houses or along streets. The income derived from these economic activities was not enough to meet basic needs but only for survival. At the same time these livelihoods strategies adapted in the area brought about further adverse environmental issues.

Thus poverty-environment interactions in an urban setting are indeed a complex and vicious circle phenomenon, whose primary indicators are the local environmental management practices, which influence access and use of environmental related services. The key urban poverty-environment indicator revolves around tenure security. Housing insecurity due to the lack of formal legal land titles and effective housing policies and legislation (regulatory environment), is associated with increases in the vulnerability of the urban poor for both landlords and tenants. Home landlords were found to use their houses as the base for businesses and/or to raise income from rent, or they would sell part of their plots or build additional structures for their children.

²⁰ Sanderson, 2000

Tenants were able to secure accommodation for cheap rent. This kind of unplanned housing development, and resulting house congestion, left little or no room for provision of environmental related services (physical infrastructure). Thus tenure insecurity reinforced the vicious poverty-environment interaction. In other words, tenure security had a strong influence on the quality of environmental management. Strategies centred on housing as an asset, such as provision of legal titles in unplanned settlements, can act as incentives to invest in upgrading houses, which in turn can help most poor urban households move out of poverty or can prevent them slipping into worse poverty.

Until now, the strategies developed by Bonde la Mpunga community were only those essential for survival. However, if the situation is left alone, it may create widespread socio-economic problems because environmental problems and related impacts (social, health, economic) have no boundaries. The fact that Bonde la Mpunga is an island of poverty surrounded by some of the wealthiest areas in Dar es Salaam — Oyster Bay, Msasani and Mikocheni – poses additional potential for social upheavals. Furthermore, if not checked, unplanned urban areas will continue to create similar situations like Bonde la Mpunga.

7.2 Recommendations

This study recommends that:

- The established urban poverty-environmental monitoring indicators (Table 20), be included in the Poverty Reduction Strategic Papers PRSP document. The objective is to address the plight of people living in informal settlements.
- Local governments, in general, need to formulate rules and regulations to guide developments in unplanned urban areas, like Bonde la Mpunga, including legalising existing dwellings in unplanned settlements to create a stable environment that can motivate landlords to invest in upgrading their houses.
- The areas for policy 'leverage' are to be found in legal, institutional and administrative structures and processes, with emphasis to be placed on land issues and effective housing policy.

7.3 Areas for Further Research

This study has revealed that urban poor are, at the same time, both victims and unwilling agents of environmental degradation. The two-way links between the processes and outcomes of environmental change, and the processes and outcomes of impoverishment, are not direct as many studies have assumed. Other research for further study, are the significant differences in perceptions of poverty and environmental change by gender. It is important to research on the capacity of men and women in vulnerable groups to cope with and respond to the associated stresses and shocks of poverty and environmental degradation. Other studies may want to examine the links between a woman's position with respect to poverty, environmental entitlements, and environmental change by targeting female 'environmental managers'.

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| 8 | <i>"Social and Cultural Factors Influencing Poverty in Tanzania"</i>
C.K. Omari | 1 | <i>"Changing Perceptions of Poverty and the Emerging Research Issues"</i>
M.S.D. Bagachwa |
| 7 | <i>"Gender and Poverty Alleviation in Tanzania: Issues from and for Research"</i>
Patricia Mbughuni | | |
| 6 | <i>"The Use of Technology in Alleviating Poverty in Tanzania"</i>
A.S. Chungu and G.R.R. Mandara | | |

Project Briefs

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| Brief 13 | Disparities Citizens' Perceptions of Service Delivery by Local Government Authorities in Tanzania | Brief 5 | Children Participating in Research |
| Brief 12 | Changes in Citizens' Perceptions of the Local Taxation System in Tanzania | Brief 4 | Changes in Household Non-Income Welfare Indicators - Can poverty mapping be used to predict a change in per capita consumption over time? |
| Brief 11 | Citizens Demand Tougher Action on Corruption in Tanzania | Brief 3 | Participatory Approaches to Local Government Planning in Tanzania, the Limits to Local Participation |
| Brief 10 | Outsourcing Revenue Collection: Experiences from Local Government Authorities in Tanzania | Brief 2 | Improving Transparency of Financial Affairs at the Local Government Level in Tanzania |
| Brief 9 | Children and Vulnerability in Tanzania: A Brief Overview | Brief 1 | Governance Indicators on the Tanzania Governance Noticeboard Website |
| Brief 8 | Mawazo ya AZISE za Tanzania Kuhusu Uhusiano Wao na Wafadhili | TGN1 | What is the Tanzania Governance Noticeboard? |
| Brief 7 | Mawazo ya AZISE za Tanzania Kuhusu Uhusiano Wao na Serikali | LGR 12 | Trust in Public Finance: Citizens' Views on Taxation by Local Authorities in Tanzania |
| Brief 6 | Local Government Reform in Tanzania 2002 - 2005: Summary of Research Findings on Governance, Finance and Service Delivery | LGR 11 | Domestic Water Supply: The Need for a Big Push |

LGR10	Is the community health fund better than user fees for financing public health care?	LGR 5	Fees at the dispensary level: Is universal access being compromised?
LGR 9	Are fees the major barrier to accessing public health care?	LGR 4	TASAF – a support or an obstacle to local government reform
LGR 8	Primary education since the introduction of the Primary Education Development Plan	LGR 3	Councillors and community leaders – partnership or conflict of interest? Lessons from the Sustainable Mwanza Project
LGR 7	Citizens' access to information on local government finances	LGR 2	New challenges for local government revenue enhancement
LGR 6	Low awareness amongst citizens of local government reforms	LGR 1	About the Local Government Reform project