

**RESOURCE RECOVERY IN PUCALLPA, PERU: HOW RECYCLING
MICROENTERPRISES ENGAGE CITIZENS, MANAGE WASTE AND
PROMOTE SUSTAINABLE HUMAN DEVELOPMENT**

Master's Thesis

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ABSTRACT

As informal human settlements grow in major urban centers throughout the developing world, the problem of poverty is being exacerbated by escalating waste generation. Poor sanitation and substandard living conditions in these settlements pose major health risks for millions of marginalized people. Many have resorted to working informally in unhealthy and unsafe conditions to scrounge through waste; selling reusable or recyclable materials in order to provide for themselves and their families. An emerging development strategy in Peru involves the creation of formalized recycling microenterprises on the outskirts of major centers that focus on approaching waste as a resource, enabling traditionally excluded communities to close the loop on garbage and contribute more formally to the local economy. The strategic formalization of recycling microenterprises can reduce urban poverty, address environmental concerns stemming from waste and pollution and increase community development. Using a qualitative, participatory approach, the Peruvian city of Pucallpa has been examined within the sustainable human development paradigm, whereby the potential of holistic approaches to development to improve the lives of individuals and contribute to the sustainable development of their larger community is considered. This study should advance the promotion of the simultaneous study of human development and environmental health and assist future development initiatives with similar goals.

Key Words: recycling, microenterprise, waste management, human development, sustainable development, holistic approach

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ABBREVIATIONS

CIA	Central Intelligence Agency
CS	Ciudad Saludable
HDI	Human Development Index
HDR	Human Development Report
HRD	Human Resource Development
IHS	Informal Housing Settlement
ILO	International Labour Organization
ISWM	Integrated Sustainable Waste Management
NGO	Non-governmental Organization
RWM	Recycling-based Waste Management
SHD	Sustainable Human Development
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WB	World Bank
WHO	World Health Organization

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We need to make them believe in themselves. They are not the poor; they are doing the work of the future. The person is first but garbage is a medium.

Albina Ruiz Rios (Founder and Executive Director of Ciudad Saludable)

INTRODUCTION

Research subject

Urban lifestyles have become synonymous with higher rates of consumption and waste creation leading to serious concerns associated with insufficient solid waste management in various growing metropolises (Gutberlet 2008:5). As a result, increasing solid waste generation attributed to rapidly unrestrained rural to urban migration and a lack of adequate infrastructure to deal with burgeoning populations is becoming a serious global issue, particularly in the developing world (Drackner 2005:175).

Concurrently, increasing amounts of people are leaving their traditional rural lifestyles in pursuit of employment and an improved quality of life in urban centres, causing informal housing settlements (IHSs) on the urban peripheries to grow at an alarming rate (Gutberlet 2008:5). Generally, these peri-urban areas are characterized by a lack of basic services, sub-standard construction and over-crowded living conditions (UN-HABITAT 2003:11). Issues with solid waste, specifically, are typically more severe in IHSs due to their illegal status, permitting municipalities to exclude them from regular waste collection services (ibid.:xxxi).

As impoverished people continue settling in IHSs in developing countries, a relative expansion of informal income generating activities is being observed. A common source of earnings for many people marginalized by poverty and working within the informal economy is derived from waste management and recycling activities (Gutberlet 2008:6). As a result, new forward-thinking and holistic approaches to poverty reduction and waste management are being considered in concert. Many people have begun to realize that waste has value as a resource in itself and we have begun to see a “paradigm shift towards more sustainable societies” in the developing world (ibid.:3). Emergent programmes aiming to formalize and dignify waste management activities are proof of this shift.

Through an in-depth investigation of an IHS in Pucallpa, Peru, we intend to highlight the relationship between waste and poverty as cross-cutting issues that can be attended to

simultaneously. Recognizing the importance of this relationship, this case study identifies the potential for improving the effectiveness of waste management interventions, thus benefitting impoverished populations and simultaneously contributing to the promotion of local and global environmental sustainability. Our study has been made possible through cooperation with Ciudad Saludable¹ (CS), a Peruvian non-governmental organization (NGO) focusing on poverty and waste management issues.

Research aim

The broad purpose of this study is to explore and advance current theory on how holistic approaches to waste management in the developing world can increase sustainability. We expect that the results of this research will shed light on the effectiveness of multi-dimensional development projects that address human well being as inseparable from the health of local ecosystems. In so doing, we expect to add to an existing range of theories that inform such development initiatives.

The study is guided by the general research question: *What impact does a recycling-based waste management system have on sustainable human development in Pucallpa, Peru?*

Research objectives

Our research is structured around three objectives serving to:

- Explore how project participants experience a specific recycling-based waste management (RWM) initiative
- Illustrate how human development can be understood in this context
- Investigate how human development can contribute to sustainability within the overall community

¹ Ciudad Saludable (Healthy City) is a Peruvian, non-governmental organization that works with the design and implementation of solid waste management systems that focus on protecting the natural environment and improving social conditions (CS 2009).

Thesis outline

This thesis has been organized to address the research objectives through a lens that incorporates the sustainable human development (SHD) paradigm according to the work of Sudhir Anand and Amartya Sen (1994 & 2000). More specifically, this refers to theoretical notions connected to the United Nations Development Programme's (UNDP) four essential capabilities for human development i.e. to live a long and healthy life, to be knowledgeable, to have access to the resources necessary to maintain a decent standard of living, and to participate in the life of the community (UNDP 2010a). This lens will include concepts related to the implications of promoting sustainability from a universalist perspective and the qualitative case study data we collected during our five-month stay in Pucallpa, Peru.

Waste management in the informal settlements of Pucallpa is a multi-faceted issue that could be approached in several different ways. The role of formalized employment, for instance, has surprised us as an extremely salient factor in this particular case. We have chosen to look at the formalization of waste management as part of the larger system however, and evaluate how it impacts the recyclers' lives, alongside a variety of other project components. In effect, our dual intention to highlight the effectiveness of holistic development initiatives alongside the importance of addressing human well being and the environment concurrently, has limited us in analyzing specific variables.

This report begins with a detailed contextual analysis, clarifying our position within the waste management debate followed by an explanation of the methods we applied to our data collection process, as well as the limitations we overcame in order to accumulate relevant information. The theoretical foundation on which we have framed our exploration of the case will subsequently be addressed, leading to the analysis where we present and expand upon our findings. Finally, we provide a brief summary of our most relevant conclusions, as well as outline various suggestions for further research related to RWM.

CONTEXT

To provide context and thus facilitate a more well-rounded understanding of the conditions influencing waste management and SHD from both a global and local perspective, the following section presents background information on the problem, the project and previous literature.

Research problem

The mounting problem of increased waste generation and its inadequate disposal in IHSs has serious implications both for the environment and the people living there. Simply attempting to deal with the waste however, and not addressing the people who are creating it and living amongst it, is an enormous mistake. Not only does there exist a great deal of economic potential in the circular economy that can be created through the recovery of recyclable materials, but also in mobilizing the human resources that are available and willing to work toward a cleaner environment and a higher standard of living for themselves and their families (Liu 2009:211).

Peru, with a population of 28.8 million (51.6% of whom live below the national poverty line) lacks effective waste management systems for the majority of its populated areas (WB 2009;



Figure 1: Pucallpa, Peru (CIA 2010; modified by Letizia & Whitty 2010)

Chauvin 2009). As a result of this circumstance, an estimated 100,000 Peruvians make their livelihoods by salvaging recyclable material from trash in city streets and landfills (ibid.). As this type of work is generally seen as unprofitable and unhealthy, the Peruvian government, in partnership with various NGOs, are attempting to address this issue by creating formal employment opportunities in the field of waste management and recycling while also educating the public on the importance of their participation in these activities (Medina 1997:2; Ruiz Rios et al. 2009).

The sparsely populated Ucayali region of Peru is dominated by the Amazon rainforest. There are few significantly large cities and approximately 300 villages throughout the region where 35,000 aboriginal Shipibo people live a traditional lifestyle (Pantone 2006). It has been calculated that 69.3% of the region's population lives below the poverty line with 43.6% of these living in extreme poverty (CS 2006a:16).

Pucallpa, capital of the Ucayali Region has a population of 349,000 and is one of the fastest growing cities in the Amazon (Rios Ramos 2009:9) (see Figure 1). Pucallpa acts as a market hub for goods being transported between the Ucayali region and Lima (846 km away) by a single paved highway. Pucallpa's main industries include forestry, fishing, two bottled beverage

manufacturing plants and a petroleum refinery plant (Rios Ramos 2009:10-11; Encyclopaedia Britannica 2009). A baseline study conducted by CS before their recycling project began, states that 44.7% of the population of Pucallpa were found to be actively employed, 45.7% underemployed and 9.6% unemployed (CS 2006a:16). Moreover, a steady increase of urban migration has led to substantial growth of IHSs on the periphery of the city, tending to house the poorest and most often marginalized citizens (Municipal respondent 1, age 58). The houses in these areas are usually simple wooden constructions with sheet metal roofs and the roads are unpaved and often impassable. Amenities such as indoor plumbing are rare while electrical and water services are often connected illegally (ibid.) (see Figure 2).

Waste management services in Pucallpa's IHSs were non-existent before CS's project implementation. Collected trash was previously disposed of in an open dumpsite at a tributary of the Ucayali River and near multiple IHSs (ibid.). This led to several negative consequences to the environment and human



Figure 2: Informal settlement (Photo: Whitty 2010)

health as the contamination of the river and ground water sources became a vector for various communicable diseases (COSEPRE 2000:2,4). Informal recyclers commonly worked at the dumpsite, scavenging for recyclable materials that they could then sell to itinerant buyers for a small profit (CS 2006a:22). While the construction of a new sanitary landfill is presently in the planning stages (due to CS recommendation and planning assistance), the city dump has since been moved to a site 22km outside of the city. The CS project began with the intention of addressing several of these concerns relating to insufficient waste collection and the unsatisfactory working conditions of the recyclers.

The project

The main objective of CS's project implemented in 2007 was to improve the quality of life of the citizens of Pucallpa through implementing a more effective and environmentally friendly solid waste management system in the IHSs, while establishing secure, dignified and healthy working conditions for informal recyclers (CS 2008:2). The expected project results included the reduction of public health risks and environmental pollution associated with poor waste management, affecting eight thousand people within fifty IHSs in Pucallpa and on its periphery, the formal employment of 45 families previously involved in informal recycling activities and an increase in education and awareness amongst the citizens of Pucallpa with regard to the importance of physical and environmental health (CS 2006b:4) (The project outlines seven specific objectives which are described in detail in Appendix A)

The specific solution proposed by CS to address a range of physical and environmental health issues in Pucallpa was designed to correspond with the Municipality of Pucallpa's enduring goals to increase waste-management services to the IHSs, increase employment opportunities within Pucallpa, and to protect the natural environment in order to increase the viability of the area as a tourist destination (Municipal respondent 1, age 58). In order to achieve these goals, as well as those set out by CS, the organization of informal waste collectors and other informal workers or unemployed persons into three formal microenterprises and one larger association of recyclers was facilitated (CS2006b:4)². The microenterprises then entered into salaried contracts with the municipality to provide waste collection services to over 76 IHSs who were previously excluded from sufficient waste collection services due to their illegal status and/or their inaccessibility (CS respondent 4, age 28). The larger association of recyclers allows the microenterprises to sell their collected recyclable materials in greater quantities directly to buyers in Lima, thereby avoiding intermediaries and gaining higher profits (ibid.).

² CS's direct involvement with the microenterprises finished in March 2010, with the majority of project objectives completely, or partially fulfilled (CS respondent 4, age 28).

Previous research

There is growing research demonstrating the value of recycling initiatives as an economic access point to the broader goal of managing waste to improve ecosystem and public health and general well being. In the following section we present a brief review of published literature relating to five themes that are particularly relevant to our case study.

Conceptualizing waste

The works of Drackner (2005), Ackerman and Mirza (2001), and Gutberlet (2008) assist this study in formulating a conceptual understanding of what waste is. Each asserts that waste can be seen as both a valuable resource *and* an economic commodity. Ackerman and Mirza (2001:114) furthermore, suggest that the accumulation of waste in the poorest areas of society can be seen as a ‘resource endowment’ on the people living there. How the average person perceives garbage however, is another aspect important to our study. As waste traditionally implies uselessness, recycling initiatives are often charged with the task of changing public perception to see waste as a potentially valuable resource and to abandon previously held prejudices against those working to recover these resources (Drackner 2005:176; Gutberlet 2008:12).

Additionally, Drackner (2005:178-179) find that people tend to associate garbage with dirt and ill health. While this can be seen positively from a public health perspective in encouraging people to adopt healthy waste disposal practices, it also stigmatizes those working with garbage in a resource recovery capacity (ibid.; Gutberlet 2008:3). Our research explores such issues as they relate to the RWM system and working conditions of the recyclers in Pucallpa. How waste is perceived by the recyclers, the public and policy-makers have important implications both for human development of the recyclers and for topics relating to sustainability.

Community-based solutions

Involving local stakeholders in the planning and implementation of their RWM initiatives across Peru is one of CS’s central mandates. Agreeing with scholars such as Medina (n.d.:3), who has seen top down and reproduced approaches fail due to their lack of consideration of local people’s opinions and traditions, CS tries to deliver programmes that consider local opinions and deliver appropriate solutions. Evoking community participation however, requires continuous effort and the consideration of numerous variables. As has been noticed throughout various case studies of

waste management campaigns in developing countries, understanding the local context, and determining ways in which to provoke the highest level of public participation possible, is the first step in any community based waste management initiative (Ali & Snel 1999:4; Furedy 1997:154).

Scheinberg (2008:5,69), in her report on an international programme enabling municipal governments to improve their waste management services in various developing countries, identified the importance of ‘multidirectional communication’ in approaches designed to encourage active community participation. Her study asserts that effective communication requires that the implementing organization or the local municipality promotes its activities regularly, invites community members to participate in planning, and offers opportunities for all stakeholders to give their opinion on project activities at all times (ibid.:18). Moreover, one of her most pertinent recommendations for achieving effective communication and sustainable results is continual reinforcement of ideas through the use of various communication channels (ibid.:72). Participatory methods are not beyond criticism, however, as Cooke and Kothari (2001) posit that participatory approaches can fail to empower stakeholders but instead lead to manipulation of processes through unchecked power differentials (cited in Gutberlet 2008:9). Nevertheless, if incorporated effectively, participatory development does have the potential to strengthen marginalized people’s voices and levels of status within society (Gutberlet 2008:10). Furthermore, participatory approaches can also help achieve far reaching benefits in the form of increased trust, transparency and accountability among individuals and in governance (ibid.:9). Such methods become invaluable in furthering education and in promoting individual and societal change in a sustainable fashion (ibid.).

Integrated sustainable waste management

Due to CS’s identification of solid waste issues as being both technical and social, it follows that the bulk of their programming approaches waste management from a comprehensive and holistic point of view (Ruiz Rios et al. 2009:123). This sort of approach, often referred to as integrated sustainable waste management, or ISWM, is gaining wide acceptance as an effective development solution that addresses waste management concerns through the use of various lenses (i.e. political, institutional, social, economic, technical and environmental) (Wilson 2007:201). ISWM approaches waste management comprehensively, whereby waste is

considered from the point of its creation to the point of its disposal (ibid.:205). Furthermore, all implications attached to the creation and disposal of the waste, and all stakeholders involved in dealing with it from start to finish are thoroughly contemplated (ibid.). ISWM is particularly pertinent with regard to our specific case in that it stresses the inclusion of stakeholders from diverse positions of power within society, which is a visible aspect of CS's project in Pucallpa, particularly with regard to women and people of lower socio-economic status.

Memon (2010:30) asserts that the 3R approach (reduce, reuse, recycle), of which recycling plays a large role, "is becoming a guiding factor" within the field of ISWM. Furthermore, implementing ISWM with a 3R lens promotes more efficient resource use, higher amounts of resource recovery, less government expenditure on waste management due to a large reduction in waste disposal demand, greater amounts of cooperation amongst citizens involved in waste-related activities, safer living environments and various other economic opportunities (ibid.:33). Within the confines of this study, we refer to the waste management initiative in Pucallpa as 'recycling-based'. This system reflects many aspects of ISWM but differs in that its core principle and driving force is recycling³.

Public-Private partnerships

Various arrangements of public-private partnerships in waste management systems have been studied in developing countries whereby service delivery is privatized while the government maintains some degree of power over the system's functioning (Baud et al. 2001:4). Cointreau-Levine (1994:2) has reported on the potential advantages of public-private partnerships, such as reducing government expenditure and bureaucratic inefficiency. Ahmed and Ali (2004:478), however, maintain that the partnership needs to include appropriate incentives for all actors, in order for the system to be efficient and dissuade corruption. Furthermore, Medina (1997:18-19) argues that developing country governments need to create policies that will support initiatives of informal recyclers to organize into cooperatives and small enterprises and that these work in cooperation with public operations in providing waste management services. These studies

³ The term 'recycling' is used in this report to refer to the official activities of the research subjects which deals with resource recovery and crude processing of recyclable material.

inform our investigation of the role of the public-private partnership between the municipality and the microenterprises in Pucallpa.

Formalization

Although much has been said about the economic dimensions of the informal economy⁴ (Soto 1989; Portes & Schauffler 1993) and the process of formalization of employment (Lagos 1995; Tokman 2001), this study concentrates on the effects that formalized employment opportunities have on SHD. This research asserts that programmes focusing on the formalization of informal waste collection and recycling activities have the potential to address numerous issues negatively affecting the lives of informal waste collectors and recyclers, as well as those within the larger community. Wilson et al. (2006:802) for example, states that the integration of informal waste-related activities with already existing municipal waste management systems has the potential to result in considerable social and economic benefits in the developing world.

According to Wilson (ibid.:807), formalizing informal recycling activities provides opportunities for informal workers to increase their efficiency and lead to better living and working conditions. Medina (2005:395) echoes Wilson's assertions, stating that formalizing informal refuse collection and recycling activities in Mexico, could result in "grassroots development, poverty alleviation, and environmental protection". Many similarities can be seen between the recycling initiative in Pucallpa and the systems described in these studies. The findings of these reports expand understanding of the role of formalization in the context under which such initiatives operate.

A case study done by Gutberlet and Baeder (2005:12) of 48 informal recyclers in Santo Andre Brazil, illustrates the various occupational health risks and social implications associated with informal recycling in the developing world. The case study details that the most common threats to the health and safety of the recyclers were derived from mechanical, ergonomic, chemical, biological and/or social sources (ibid.:10-11). According to the study's concluding remarks, formalizing the recyclers' activities likely leads to the provision of safety equipment and proper training and would potentially provide them with "opportunities to tackle their serious health

⁴ Informal economic activities refer to unregulated and unregistered employment generally "utilized by marginalized populations to 'get by' in highly precarious economic circumstances" (UN 2005; Leonard 2000 cited in Gutberlet 2008:6).

issues” (ibid.:12). Additionally, the report concludes that formalization contributes to the reduction of social exclusion of the recyclers who are often victims of discriminatory behaviour due to the stigma associated with working with waste (ibid.). Furthermore, providing recyclers with uniforms or identification cards, in order to formalize their appearance, should improve their relations with their local communities, and help to increase their self-esteem (ibid.; Medina 2008:2).

Medina (2005:395) also explores the role that formalization can play in improving environmental health and contributing to ecological sustainability. His study hypothesizes that formalization should discourage the illegal dumping of valueless waste by informal waste workers (ibid.:392). Municipal landfills and dumps in developing cities tend to be located on the periphery of the city limits. Without access to vehicles (most informal recyclers use carts drawn by animals or man-power), it is very common for informal workers to remove valuable materials from the garbage and then leave the remaining waste in the street, vacant lots, bodies of water etc., posing various risks to human and environmental health, and in effect contradicting the benefits that their recycling activities are producing (Medina 1997:25). Formalized recyclers, alternatively, will be supplied with legally designated areas to separate recyclables, and dispose of organic waste (Medina 2005:395).

We recognize, however, that not all development experts believe that formalization of employment is the most appropriate strategy in developing countries. A structuralist perspective, endorsed by organizations such as the ILO and WB, views the informal sector as a source of dynamic entrepreneurship that has the potential to drive development in the absence of government involvement (Meagher 1995 cited in Debrah 2007:1067). Additionally, the formalization process in developing countries is often ineffective because excessive bureaucracy makes it extremely time consuming and costly (Lagos 1995:112). In Pucallpa, however, CS is using formalization as a means to integrate informal recyclers into the municipal waste management strategy in an attempt to promote structural change.

METHODOLOGY

Research design

Utilising a qualitative design framework, we have chosen to address an apparent lack of published studies that examine human development from a non-numerical perspective (see the

United Nations' Human Development Index (HDI) 2010)⁵. The use of qualitative methods and full immersion into our research setting facilitated an in-depth, ethnographic examination of the specific social phenomena that affect our research subjects'⁶ lives (Ragin 1994:91; Bryman 2008:465). Furthermore, our study has been largely guided by interpretivist and phenomenological principles whereby the experiences and actions of our research subjects are evaluated subjectively and according to their own understanding of specific events and subsequent impacts (Bryman 2008:15-16). Inspired by hermeneutic interpretation, we also sought to understand the experiences of the research subjects in relation to the larger social context of the case (Alvesson & Sköldberg 2000:53). Finally, taking a constructionist stance, we recognize that the views and opinions of our research subjects are in a continuous state of creation and revision, as are our own as researchers (Bryman 2008:19). Our conclusions, thus, have been co-constructed in a fairly reflexive manner (Davies 1999:8)

We apply analytical induction throughout this study, moving between data and theory in an iterative manner, searching for similarities which eventually lead to conclusions (Ragin 1994:93). In effect, we have collected empirical data from various sources within our research setting and compared it to existing theory on sustainability and human development in order to explain the impact of a RWM system in a specific context, and add to theory promoting holistic development approaches.

Method of inquiry

This research study employs a single-case design whereby an RWM initiative in Pucallpa, Peru was chosen as an exemplifying case of a holistic development programme emphasizing both human development and environmental sustainability. The initiative was carefully chosen as an opportune setting in which to explore the effects of an integrated development project on SHD. The case study is 'embedded' in the sense that the larger case of the RWM project we examine is illustrated through an investigation into multiple sub-units that include the recyclers, the informal

⁵ The HDI is often criticized for its use of quantitative indicators as being inadequate in measuring a multidimensional concept and does "not allow us to see the relative importance of its different components or to understand why a country's index changes over time" (Sanchez 2000:13; Soubbotina 2004:112).

⁶ We will refer to the recyclers throughout this study as our 'research subjects' due to their central role within the case, while other people we interviewed or observed are cited as 'respondents' (refer to Appendix B for a full list of respondents, categorized by employment, age and sex).

settlement communities and various institutional structures in Pucallpa (Yin 1989:49). At the same time, these sub-units are analysed hermeneutically in relation to the larger case as a whole (Alvesson & Sköldbberg 2000:53).

Sampling strategies

Purposive sampling was utilized in selecting recyclers and CS project staff as respondents due to their key role within the RWM initiative (Bryman 2008:415). Subsequently, theoretical sampling occurred as the research frame grew to include external factors and influences of the CS project which led us to seek respondents from the municipality of Pucallpa as well as people working as informal recyclers throughout the city (ibid.).

We sought to interview as many recyclers as were willing and available to speak with us, resulting in recorded conversations with 27 of 49 recyclers working for the microenterprises. The recyclers whom we were not able to speak with were either unavailable due to time constraints, illness or injury, or were unwilling to participate. Additional interviews were conducted with two employees and two volunteers working with the CS project in Pucallpa as well as the founder and executive director of CS in Lima, two employees of the municipality of Pucallpa who were directly involved with the projects, and nine informal recyclers working at the local landfill site. Moreover, as volunteers at CS, we assisted in creating and conducting a questionnaire to 217 residents throughout various IHSs in Pucallpa (employing stratified random sampling as per CS's instructions) (Bryman 2008:173) (see Appendix C for a list of questions). The process of conducting the survey influenced the forming of our qualitative inquiry and will be regarded as participant observation when consulted in the analysis.

Methods

Participatory methods were chosen based on their ability to gain first-hand understanding of the perspectives of the recyclers and our other respondents. Both primary and secondary methods have been utilized in an attempt to triangulate the data, reduce biases, and provide more well-rounded conclusions (Ragin 1994:99-100; Creswell 2003:15-16). Data collection occurred over a five-month period in which we lived in Pucallpa, observing the recyclers and gaining first-hand experience while participating in their day-to-day activities. We recognize that the close relationships we built with our research subjects as a result of our high level of participation has influenced both their actions as well as our interpretations of their behaviour throughout the data

collection process, but have also led us to ascertain a more personal and deeper interpretation of their social world (Davies 1999:3).

Data Sources

Primary data

a) Focus groups

One focus group was conducted during the preliminary stages of the data collection period to allow us to introduce our research study to the recyclers who would potentially be participating. The focus group took the form of a group interview whereby participants were encouraged to share and discuss their work as recyclers, while focusing on both the positive and negative aspects of their job. The focus group method encouraged group discussion and interaction which resulted in a more naturalistic environment within which to determine the ways that our potential research subjects interpret their occupations (Bryman 2008:476). The results of the focus group helped to inform and guide the proceeding investigation.

b) Interviewing

Although we entered into interviews with a structured list of questions pertaining to certain themes, the actual interviewing process was conducted in a semi-structured, but also flexible manner. This allowed the respondents to influence the direction of the interview while also introducing the researchers to new concepts or new angles on topics under investigation (Kvale 1996:97) (see Appendix D for a full list of interview questions).

Additionally, the use of oral history interviews⁷ allowed us to gain a deeper understanding of the broad themes and significant events in the lives of the research subjects (Bryman 2008:196). The process of collecting this data also gave us greater insight into how CS's recycling intervention has fit into the course of a specific research subject's life, and the way their SHD has been influenced. In conducting these interviews, we sought to act more as facilitators than interviewers, encouraging the respondents to tell their story in full (Mason 2002:232). While it was requested that they concentrate on the specific theme of their working lives, the respondents

⁷ Oral history interviews consisted of us asking certain recyclers to give us an unrestricted, detailed account of their lives directly before and after CS's project implementation.

were also encouraged to structure, frame and sequence their stories in ways that were considered meaningful to them (ibid.).

Interviews were conducted in Spanish, recorded and later transcribed and translated into English. The questions were sequenced in such a way as to cover specific themes that explore the ‘what’ and ‘why’ of the recycling system and its impact on human development (Bryman 2008:442-447). From this point the themes moved towards more expansive questions of ‘how’ the system impacts SHD and what elements contribute the most to its effectiveness (ibid.).

c) Participant observation

Inspired by ethnographic methods, we engaged in participatory observation throughout our data collection period whereby we were highly involved in the daily activities of our research subjects, but with them being fully aware of our research objectives (Gold 1958 cited in Bryman 2008:410). Within this role as participators, we employed various types of observational analysis according to what was considered appropriate at the time, ranging from:

1. Total participant - whereby we practiced complete immersion in specific situations, recording notes once the event had concluded. More precisely, we worked alongside the recyclers on various occasions, carrying out their everyday tasks in order to gain a first-hand understanding of their occupational experiences. We also attended various social events with the recyclers and their families, as well as with CS and municipality staff.
2. Researcher-Participant - whereby we were involved to some extent in specific situations, observing and taking notes. This level of participation most often took place before, during and after interviews with the recyclers and other respondents.
3. Total researcher - whereby we placed ourselves completely outside of the situation, silently observing the research subjects interacting. (Gan 1968 cited in Bryman 2008:412)

Secondary data

In addition to primary data collection, we undertook an evaluation of secondary data in the form of relevant literature and CS’s project documents. Recently published studies examining different themes concerning waste management in developing urban areas provided a useful source of supplementary information, while project documents supplied us with exact details of events that occurred over a long period of time within the case study context (Yin 2003:86).

In evaluating secondary data, however, we remained mindful that the documented information was prepared for a specific purpose or audience and for that reason it may not provide a completely objective viewpoint (Yin 2003:87). As various documents were reviewed, evaluations of the accuracy of the records and the usefulness of the information to our research study was constant (ibid.:89). Also, information that arose in the secondary data that is contradictory to data gathered through primary means led us towards further probing (ibid.).

Trustworthiness and ecological validity

We conducted our research and present this study attempting to comply with what Lincoln and Guba (1985 cited in Bryman 2008:377) have termed ‘trustworthiness’. In effect, we have tried to enhance transferability, which refers to how well research results will hold up in other contexts, by offering detailed descriptions of the recycler’s reactions to the RWM system as we observed and experienced them (Geertz 1973 cited in ibid.:378). Also, we intend to increase the dependability of the study by keeping records of all forms of raw and coded data and making them available for outside investigation (Bryman 2008:378). In addition, our study can be considered ecologically valid, insofar as our use of participatory methods over a long duration has resulted in findings that reflect the true essence of our research subjects’ normal, everyday lives (ibid.:33).

Limitations

The most significant limitation in our research was the challenge of working in another language. The majority of our respondents spoke only Spanish and adequate translating services were unavailable. As we are both able to communicate functionally at the ‘professional working level’ in Spanish, we were able to collect and translate data without assistance (ILR 2010). At the same time, we realize that our inability to speak fluently stood in the way of obtaining a complete and nuanced understanding of the collected data. Although this has implications for the accuracy of our research to some degree, it must be recognized that working with interpreters also tends to reduce accuracy and limit one’s ability to engage in dynamic dialogue with respondents (Bujra 2006:173-174). In order to alleviate this limitation somewhat, an audio recording device was used to record interviews and capable language assistance from CS’s project coordinator was sought when deemed necessary. Overall, we maintain that conducting interviews ourselves

helped build trust and allowed us to be more closely involved in the interview process resulting in our gaining a greater understanding of our research subjects.

Secondly, time constraints became a limitation with regard to the depth and breadth of collected data. An unexpected work stoppage in the middle of our data collection process (whereby the main work contract that the microenterprises had with the municipality was cancelled at the beginning of December) played a large role in causing us to hasten data collection. As a result of the stoppage, numerous recyclers temporarily stopped working for the microenterprises in order to continue earning an income elsewhere while the contract was in the process of being renewed. This made the finding of certain recyclers for interviewing fairly difficult, and forced us to hire two research assistants for a short period of time to assist in completing interviews.

Furthermore, regardless of the documentation and assurances provided to the respondents regarding our third-party position as researchers, it is possible that they continued to assume that we were affiliated with CS or the municipal government in Pucallpa. As a result, insincere responses may have been given at times, as our research subjects may have felt the need to avoid giving critical feedback in order to protect themselves (and their employment security). However, we believe that the large amount of time we spent with them and the trust that was created amongst us helped to reduce this limitation.

Finally, we realize that perceived differences in power relations between our research subjects and ourselves may have influenced our findings. In order to combat this, we tried to avoid behaviour that may have functioned to reinforce feelings of powerlessness in the respondents (Scheyvens & Storey 2005:149-150). For instance, although the recyclers continued to refer to us using official titles and the formal verb usage *usted*⁸ in Spanish, we repeatedly attempted to discourage this behaviour and were eventually able to converse on a more informal level. Furthermore, we continually used our spare time and resources to assist the recyclers in their daily activities, taking part in full days of recycling and sorting with the recyclers and spent numerous hours socializing with them outside of work hours in an attempt to create a more comfortable rapport.

⁸ *Usted* is a customary term of respect used to address people unfamiliar to, or considered to have more authority than the speaker.

Ethical considerations

This study follows conventions of ethical practice throughout data collection and presentation. Primarily, each respondent interviewed acted voluntarily and provided signature of informed consent (Kvale 1996:153-4). Additionally, confidentiality and anonymity is assured to those involved in the study through the use of blurred photographs, fictitious names, and the omission of information that obviously identifies a particular subject as its source (ibid.:259-260). Moreover, the research was conducted in a manner sensitive to the constructs of the local culture paying attention to ensure appropriate conduct in gender relations and that gender was equally represented in the choice of respondents (Scheyvens & Leslie 2000). Finally, we have attempted to present the respondents' views as accurately as possible and as being distinguishable from the interpretation of the researchers (Mikkelsen 2005:336-337).

Analytical process

Throughout the data collection process we analysed data hermeneutically as patterns formed and new information emerged. In this way, we were persistent in moving between our pre-existing views of the recyclers' realities and the constant re-interpretations we were creating as a result of continuous time spent in their presence. Furthermore, we regularly re-interpreted these views upon examining them in light of more intangible contextual factors such as RWM and Peruvian society as a whole.

More specifically, we transcribed and translated interviews regularly, and reviewed results alongside our field notes to inform further data collection. Upon conclusion of the data collection process, congregated field data was reviewed in detail alongside secondary data, and extensively annotated. We then utilized several analytical methods similar to those associated with Corbin and Strauss' grounded theory approach, whereby an additional examination of both data and annotations led us to create various codes or key words, based on concepts that were frequently emerging, and which we deemed relevant in relation to our theoretical framework (cited in Bryman 2008:542-543). For instance, the UN's four essential capabilities for human development were used as a filter by which we extracted several ideas. Next, we grouped similar codes into an assemblage of categories, further relying on the four capabilities as well as various aspects of sustainability as guiding principles. Scanning through our entire body of data once more, we selected noteworthy excerpts from interviews, field notes and published literature and

placed them within the various analytical categories. Once the categories had been saturated with relevant information, several of them were combined and condensed in order to proceed with a manageable number of analytical themes, each of which is presented in the analysis section of this paper.

THEORETICAL FRAMEWORK

There is an increasing tendency amongst contemporary development programmes to include components equally concerned with increasing capabilities of the poor while also recognizing the importance of advancing their options for the future and for future generations (Anand & Sen 1994). Combining these mutually reinforcing concepts, with the first acting as the foundation of the human development paradigm, and the second providing the basis for a consideration of sustainability, has allowed development thinking to progress a great deal in the past few decades (ibid.; Streeten 2005). As a result, a holistic and integrated view of development has been produced, namely the sustainable human development paradigm (Anand & Sen 2000). This research study has largely been guided by a SHD framework (according to Anand and Sen's interpretation), including elements of both human and sustainable development theories, each of which will be described and operationalized below (ibid.). Thus, we assert that employing development programs that utilize a SHD framework is an effective way to reduce poverty, improve human development and promote environmental conservation.

Human development

Human development theory emerged in the late 1980s, at the end of a decade characterized by structural adjustment and development policies predominantly focused on promoting economic growth (McNeill 2007:10). The paradigm opposes the logic that economic growth alone will produce a healthier and more educated population better able to exercise choice and thus achieve their full potentials (ibid.). In exploring the philosophy of human development, several theorists (among them the founders of the human development approach, Mahbub ul Haq and Amartya Sen), began to compile a more people-centered development theory built on the principles of expanding peoples' capabilities (Streeten 2005:18). The resulting concept of human development that is employed throughout this study has since become a celebrated development paradigm inspiring monumental shifts in global development policies.

We see human development as a multidimensional concept that also holds to a central theme based on creating environments in which people are able to “develop their full potential and lead productive, creative lives in accord with their needs and interests”. (UNDP 2010a). Further, it is built on the principle that all humans have an innate potential to achieve certain capabilities (UNDP 2007:1). The purpose of development, therefore, should be to foster environments and create opportunities whereby people can realize these capabilities (ibid). Sen’s capabilities approach, which has been operationalized from a human development perspective for the purpose of this research, offers a model of development that goes beyond meeting people’s basic needs in an attempt to expand their freedoms and functioning (Fukuda-Parr 2003:302-303).

It is expected that there will be diversity in human development priorities among different cultures. However, there are certain capabilities that are universally understood to be fundamental elements in any evaluation of human development, and for that reason we have used them as guiding concepts throughout this investigation (UNDP 2010a). They are as follows:

1. To live a long and healthy life
2. To be knowledgeable
3. To have access to the resources necessary to maintain a decent standard of living
4. To participate in the life of the community (ibid.)

These capabilities are also the basis of the oft-cited HDI, which is a quantitative measure of three elements: adult literacy and mean years of education, life expectancy at birth and average income (UNDP 2007:36). Annually, each country receives a numeric decimal score as an indicator of their average level of human development. Although it has received criticism for its tendency to simplify an inherently complex concept, the HDI has also been praised for its ability to clearly display vital information to a large public audience in a way that is easy for them to understand (Sanchez 2000:13). The fourth capability, the ability ‘to participate in the life of the community’, has also been measured quantitatively in the past, using the Human Freedom Index (HFI) which was a part of the Human Development Report (HDR) in 1991 (Jahan n.d.:14). This study was undertaken, however, with an intention to fill in some of the gaps that numerical indicators of development such as the HDI can create.

Sustainability

The concept of sustainable development surfaced as a result of widespread concern related to the increasing “overexploitation of natural and environmental resources” being observed at varying levels throughout the world (Anand & Sen 1994:7). Eventually becoming an international policy objective, sustainable development is now a term used widely by development professionals and politicians alike, but the way people define and attempt to operationalize the concept varies a great deal across nations and disciplines (Soubotina 2004:8). While conducting this study, we have relied heavily on the following description of sustainable development, due to its exhaustive nature and the various important conditions it imposes:

In order for development to continue indefinitely, it should balance the interests of different groups of people, within the same generation and among generations, and do so simultaneously in three major interrelated areas - economic, social, and environmental. So sustainable development is about equity, defined as equality of opportunities for well being, as well as about comprehensiveness of objectives (ibid.:9).

According to Soubotina’s assertions, it must be ensured that resources and opportunities be shared equitably among people in this generation and future generations, while also addressing all three pillars of development (HDR 1994:13). Demand for this sort of intersectional and intergenerational equity reflects tendencies towards the discipline of universalism, as understood by Anand and Sen (2000:2040):

Universalism requires us to extend the same concern for all human beings irrespective of race, class, gender, nationality, or generation/.../This importance relates to the personhood of people: human beings seen as persons not as means of production. The overarching relevance of sustainable human development lies in that basic recognition.

Universalism, thus, becomes the “common thread” that connects the goals of human and sustainable development in both the present and the future, whereby it becomes incongruous to attempt to fulfill one goal without also regarding the other (Anand & Sen 1994:1).

It must be mentioned, however, that a number of development theorists believe that the goals of sustainability and development, as we now associate them, are incompatible. To them, increasing levels of human development will require faster economic growth and increased consumption resulting in greater demands on the earth’s limited natural resources (Dewan 2009:149; Soubotina 2004:2). Thus, we have framed our research study in a way that considers this argument but advocates recognition of the “conservation aspect of recycling and valuing the

social and environmental service of recyclers” (Gutberlet 2008:3). We have viewed an RWM system therefore, as a way to promote development that is truly sustainable due its ability to alleviate poverty *and* act as a means for protecting the environment at the same time (Anand & Sen 1994:12).

Sustainable human development and the case study

CS’s recycling initiatives intend to positively impact both the environment and human lives reflecting principals congruent with SHD and universalism. According to one CS staff member, “In all cases we are working for sustainable solutions. We must not think only of economic sustainability, we must also address social and environmental concerns” (CS Respondent 1, age 42). The recycling project is designed to benefit the recyclers by increasing their capabilities in a sustainable fashion. The SHD paradigm offers a framework through which we can evaluate the effects an RWM project has had in achieving this goal.

The four basic human capabilities explored throughout this study are not strictly defined within development literature due to the importance of using contextualization when examining capacity (Sen 2005:157). As a result, we formulated our initial research plan by combining various sources of information (including published literature and personal observations) to create broad definitions of the capabilities, meant to serve as a basic guideline. As the study continued, interpretive principles were utilized whereby the research subjects constructed their own meanings behind the complex concepts that we were attempting to qualify. The conceptualizations of these four indicators are thus formulated in an iterative manner throughout the investigation and the proceeding analysis reflects this process.

We have operationalized SHD in this case study by examining the UN’s four capabilities as essential components of the recyclers’ human development with the assumption that human development does not only serve to benefit them individually but must also be seen as contributing to sustainability of the greater community. The

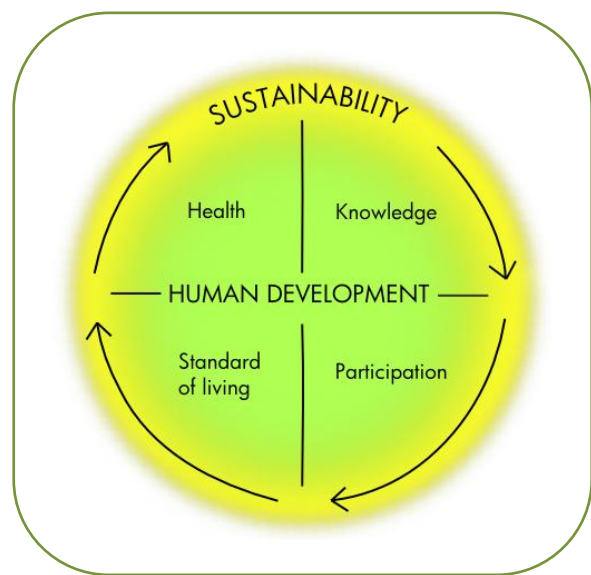


Figure 3: Sustainable Human Development (Letizia & Whitty 2010)

resulting sustainability can hence be viewed on multiple levels: the IHSs locally, Peru nationally and globally (see Figure 3).

ANALYSIS

In the subsequent analysis, our data is presented according to various themes aligned with the aforementioned SHD framework, supplemented by sub-categories identified through our analytical process. First, impacts related to the four essential capabilities as our research subjects experienced them are described in relation to relevant literature. Afterwards, we address the most salient factors affecting sustainability within our project context outside of the human development sphere.

Human development

To live a long and healthy life

a) Physical health

One of the primary objectives of CS' project in Pucallpa is to create safe working environments for the recyclers, thereby reducing risks to their physical health and safety. In this study we inquired into the recyclers' health as it is defined by the WHO (2003) as, "A state of complete physical, mental and social well being and not merely the absence of disease or infirmity". A baseline study conducted by CS in 2006 revealed that before project implementation, nearly half of the surveyed informal recyclers working in and around Pucallpa had suffered from some sort of a work-related illness or accident (CS 2006a: 35). Workshops were subsequently conducted as part of the project educating the recyclers on the "integral management of solid waste, the solid waste cycle and diseases caused by the mismanagement of solid waste" (CS 2007:8).

Accordingly, when we asked the current recyclers to describe their physical health, the vast majority responded that their health is the same or better than it was before they started working for one of the microenterprises. However, a few recyclers did report experiencing very minor health concerns that could be attributed to their work, ranging from back pain to unspecified illnesses of a short duration.

Although the formalized recyclers appear to be quite positive regarding their physical health, their concerns about workplace *safety* were more obvious. Many expressed concern that the

recycling centres (where waste is brought and recycling is sorted) are ill equipped, compromising their ability to work in a manner that can be considered entirely safe. Although all of the recyclers were provided with personal protective equipment that consisted of a uniform shirt and pants, gloves, masks, and caps at the beginning of the project, many of these items were lost or stolen and many new employees who were never provided with these items chose not to use their own resources to better equip themselves (CS 2006c:12). Some complained also of the lack of bathrooms and washing up areas within their workplace as the recycling centres each have only a single standpipe for water, hand soap is rarely available and sanitation facilities are substandard, dirty and lack privacy. One recycling centre - renting their facility from the municipality - occupies the site of an abandoned medical clinic with broken windows and a partially caved-in roof.

The lack of waste management services in IHSs also poses severe risks to public health. The WHO reports that one quarter of diseases affecting the world's population are attributable to prolonged exposure to environmental pollution (cited in UNEP n.d.:1). Previously, when the IHSs of Pucallpa received no waste collection services, the population would routinely dispose of solid waste by dumping it into the streets, rivers and into vacant areas that became de facto dumpsites due to the accumulation of waste from numerous households. Also, burning trash continues to be a common practice of dealing with domestic waste in Pucallpa. Open dumping and burning trash both contribute to worsening environmental conditions which can lead to endangering the health of the residents living nearby (UNEP n.d.:3-7).

Pucallpa is situated in a low-lying, marshy area where many homes are built close to or above rivers and streams that are heavily polluted by solid waste. On several occasions, community members in these areas revealed to us that they threw their garbage in the nearby bodies of water when waste pickup services were absent or inadequate. We learned that these waterways lead to the nearby Ucayali River and thus contaminants from the garbage pose risks to several downstream aboriginal Shipibo communities that make use of the Ucayali River for their basic needs of drinking and washing.

Burning waste also creates a risk to public health because of the harmful effects of released smoke and gases. Black smoke and complex chemical compounds become airborne contaminants released through the burning of plastics (Simoneit et al. 2005:6962). The chemical additives commonly found in soft plastics are believed to be carcinogenic to humans and can

produce harmful and irreversible health effects when inhaled (ibid.). Due to the close proximity in which people live within the IHSs of Pucallpa, when individual households burn their garbage, the health of everyone in the neighbourhood is put at risk. Several recyclers complained to us about their uneducated neighbours and friends continuing to burn garbage even though they had been told it was bad for their health and for the environment. It is clear that they felt that their role as recyclers is to contribute to the reduction of bad environmental behaviour such as burning waste.

CS implemented several citywide education campaigns throughout the project's duration promoting proper waste management practices and focusing on discouraging people from dumping or burning their trash (CS 2009). This combined with the microenterprises' waste collection service has apparently been effective. One elected leader of an IHS remarked, "The neighbourhoods are much cleaner now and the difference is obvious....The people [living here] are happier now that the city is cleaner" (IHS respondent 2, age 47). It is apparent that the residents realize informal dumping of trash and litter and burning waste are activities that can be harmful to the environment and to their health but these behaviours continue - although to a lesser degree - as a habit of convenience that is difficult to break.

b) Mental health

Equally important as physical health in an analysis of human development is the component of mental health. In this study we sought to discover the effects that the formalization of the recycling profession has had on the recyclers' mental health with regard to job satisfaction, social acceptance, dignity and stress.

When considering job satisfaction, we found that the implications of providing poor people with socially desirable work are tremendous. It became clear that among the recyclers, occupational desirability had various connotations. Common reasons for feeling that they had desirable employment related to: their formal status, steady wages, and the workplace safety provisions provided at the microenterprises. Another salient factor is the camaraderie that clearly exists among the recyclers. One recycler, in explaining why he preferred working with a microenterprise to working informally asserted, "As an informal [recycler], you only work for recyclables, you do not have the security of a monthly salary. Informals are alone, they do not have friends to work with" (Recycler 9, age 60). Even though their daily tasks are physically

demanding and almost always involve dealing with other peoples waste, the recyclers who had previously been out of work or working a more difficult or dangerous job (such as forestry), seem to be more grateful for their work at the microenterprise than others who had no previous work experience.

Another factor affecting the desirability of work at the microenterprises appears to be the increase in social acceptance that usually accompanies formal work. Consistent with the bulk of research consulted, Medina (1997:31) asserts that the integration of informal workers into organized recycling programmes addresses economic, social and environmental problems, in a socially desirable manner. In effect, rather than encouraging the condemnation of a practice such as 'scavenging', NGOs like CS attempt to transform scavenging activities into more socially acceptable 'resource management activities' (Medina n.d.:3). As a result, the citizens of Pucallpa have begun to see the presence of the municipally endorsed, formal recyclers in their neighbourhoods as a benefit rather than a nuisance. Community leaders tended to respond positively about the presence of the recyclers in their neighbourhoods. In addition, various recyclers expressed that they received more respect as formalized workers and that the increased levels of support from the local communities was quite obvious. On the other hand, a few recyclers complained regularly about lack of support from community members and others revealed that a handful of people in the more affluent communities they service treat them like "lower class citizens" (Recycler 26, age 28).

The creation of legitimate, formalized recycling businesses in developing countries where informal employment and poor sanitation services are commonplace, allows people to feel as though their jobs and working conditions are more dignified and so too are the environments in which they are living (Coad 2005:215;Medina 1997:31). The recyclers often associated dignity and pride with the fact that they are working formally instead of informally. Furthermore, they felt that formal work raises their income, their social standing, and their skill level in a way that can allow them to feel as though they are no longer 'scavengers' but rather people working for a legitimate business. Frequently, the recyclers claimed to be proud of their jobs and to have experienced increased self-esteem as a result of their employment with one of the microenterprises. One respondent who previously worked as an informal recycler stated, "My self-esteem has improved. I was working by myself, recycling and working with garbage as an informal and I made less money" (Recycler 8, age 56).

Despite the difficult nature of working with garbage and the negative perceptions people often associate with such professions, it was rare for the recyclers to express any obvious embarrassment or feelings of stigmatization with regard to their work. One recycler, who formerly worked in the logging industry before becoming employed at one of the recycling microenterprises, conveyed that he felt that his previous job made him feel ashamed in comparison to his work as a recycler. As a logger he had been harming the natural environment, but now he is working in a field that is actually *benefiting* the environment (Recycler 12, age 24)

An important mental health risk associated with informal recycling is work-related stress. Uncertainty about one's status of employment, specifically, seems to evoke the highest levels of stress amongst informal workers, increasing their risk of developing a number of common mental disorders (Ludermir & Lewis 2003:485). Our inquiries into the recyclers' experience of occupational stress revealed similar results. Although one trend we noticed was to express feelings of security and contentedness as a result of their steady and formalized work in the microenterprises, another pattern revealed recyclers' concerns about the vacillating nature of their employment contract with the municipal government who supplied their wages.

To be knowledgeable

Examining the impact that CS's recycling project has had on levels of knowledge amongst formalized recyclers led us to largely disregard the typical literacy and enrolment rates-based knowledge indicators used in development research in place of a lens that places more importance on skills and capabilities (UNDP 2010b). Seeing as how one of CS's main organizational goals is to "help create and strengthen enterprise initiatives and public policies regarding clean production in small and medium businesses" it follows that project beneficiaries in Pucallpa are meant to be given opportunities to expand their knowledge regarding recycling-based waste management, alongside other important administrative skills (CS 2010). A number of recyclers reported that their knowledge bases have indeed increased as a result of CS's project, resulting in them feeling more capable, empowered and valuable amongst other things.

Capacity building, although an overarching theme found throughout this analysis, also applies directly to knowledge and skill building amongst the recyclers in Pucallpa. Within the context of our case, the most suitable definition of capacity building is the "sustainable creation, retention,

and utilization of capacity in order to reduce poverty, enhance self-reliance, and improve people's lives" (UNDP cited in World Bank 2005:6).

The most prevalent capacities amongst the recyclers, as a result of CS's project implementation, were clearly the skills of collecting, sorting and selling discarded items of value, or rather, recycling. The fairly extensive training provided to the recyclers allows them to determine the safest and most efficient way to recover valuable objects from the garbage, but also makes them conscious of how important a skill this is - both for their own economic purposes and from a broader ecological standpoint. One recycler informed us that he had "learned a lot about recycling, the difference between organic and inorganic waste, the difference between other types of recyclables, and what has the most value" (Recycler 24, age 39). Indeed, it was made obvious to us that the technical knowledge, with which the recyclers had been equipped, such as separation, processing preparation and machinery usage, is extremely useful (see Figure 4).



Figure 4: Recyclers utilizing machinery to process recyclable material (Photo: Whitty 2010)

Although the process of recycling may seem simple to an outsider, in Pucallpa numerous variables add a fair amount of complexity to the job. Distinguishing materials based on their value categories, determining who to sell the recyclable material to and at what price, deciding when to sell based on market price, and learning how to use and maintain their waste carts (see Figure 5) are only some of the skills we saw the recyclers employ. When new recyclers begin working for one of the microenterprises, they are taught these skills by the more senior and experienced staff. Indeed, it seems that skills knowledge is being transferred successfully, and thus the effectiveness of the initial teachings is being sustained.

The recyclers also revealed to us that they have attained skills regarding basic microenterprise operation and management. Furthermore, the recyclers purported that their knowledge regarding the importance of global and local environmental health had increased a great deal. Some recyclers reported using the knowledge they have gained by working with CS to educate their friends, family, neighbours and even strangers, “I know now that there are certain things that are bad for the environment, like burning garbage”, says one recycler, “when I see people doing this, I always tell them to stop, and to put the garbage in bags so that I can take it away for them” (Recycler 11, age 44).



Figure 5: Recyclers empty a full waste cart after completing collection (Photo: Whitty 2009)

At the same time, it is difficult to reconcile the recyclers’ assertions of increased environmental awareness with various displays of behaviour that showed the contrary, such as littering and disinclination to pick up invaluable garbage if it was deemed too inconvenient. For instance, while working with the recyclers gathering waste from various households in one of the IHSs, we were told not to pick up litter from the ground that we may happen upon, as it would slow us down too much.

Although CS’s efforts to educate the recyclers and keep them informed about environmental issues were generally effective, we did notice other key areas where knowledge transfer has failed to take hold. The most obvious of these areas, and which should be an integral part to any development initiative involving microenterprise creation, is within the realm of managerial and administrative skills. Certainly, a select few recyclers had been trained as managers by CS staff throughout project implementation and informed on how to keep a monthly budget and create proposals for contract agreements with the municipality. Their lack of basic computer skills and inability to make important administrative decisions however is a concern. Indeed, a CS staff member revealed to us that she felt the recyclers would struggle to run the microenterprises after CS leaves and she admits that the project should have concentrated more on teaching “the

recyclers, from the very beginning how to do the most important administrative things to run the microenterprises” (CS respondent 4, age 27). In response to these concerns CS has delayed their phase-out by several months and are stepping up efforts to train selected recyclers in administrative and basic computing skills.

According to Anand and Sen (1994:16), “The human development approach must take full note of the robust role of human capital”. For the recyclers, human capital refers to the valuable and marketable skills related to recycling and microenterprise operation that they have acquired as a result of their involvement in CSs project. Their new knowledge set facilitates economic progress, while also increasing their levels of SHD (ibid.). A particular group of recyclers that we spoke with, who worked together as co-managers of one of the micro-enterprises, seemed distinctly aware of their heightened levels of human capital. They are confident in the skills they have as recyclers and realize how integral their role is in the successful functioning of their microenterprise. They are so confident in fact, that they had been approaching the leaders of other municipalities, attempting to market their services and gain new contracts (Recyclers 1-4, ages 45, 33, 39, 34).

To have access to the resources necessary to maintain a decent standard of living

Despite much of the dialogue regarding human development being focused on shifting the emphasis on promoting economic growth, income remains an essential component of being able to live at a decent standard of living (Haq 1995:21; Anand& Sen 2000:2031). However, increasing income must not be an end in itself but must be seen as a means of meeting basic needs and building capabilities (ibid.:2032). Based on these principles, this investigation sought to determine the resulting impact that a more stable income has on the recyclers’ SHD. Many recyclers expressed that one of the primary benefits of working for a microenterprise is the provision of a monthly salary. With the municipal contract the recyclers receive a monthly wage of 460 soles/month (\$160US) (CS 2006b:4). This amount is fairly low even relative to wages in Peru. Nevertheless, the majority of recyclers stated that their wages are sufficient in allowing them to at least meet their basic needs as well as those of the people that depend upon them. The recyclers often emphasized the importance of having a steady wage and job security, as one previously informal recycler said of the difference between working informally and in the

microenterprise, “It is better in the microenterprise because here the work is secure, but you can definitely earn more money working as an informal [recycler]” (Recycler 15, age 35).

We found several recyclers who shared this same preference for formal employment over the opportunity to earn more money in a less desirable environment (see Figure 6). However, there seems to be wide variation in the degree to which the recyclers are able to make their wages stretch. While some are forced to seek out supplementing sources of income just to provide basic needs for themselves and their families, others are currently saving for the future, to pay for tuition and to buy luxury items such as television sets and DVD players. Upon further probing, it appears that those able to save money have fewer people depending upon them for financial support or are not the sole wage earner of their family.



Figure 6: Regular working conditions of informal recyclers at city dump (Photo: Whitty 2010)

Yet, the fact that the wages are stable from month to month means that the recyclers in the microenterprises do not have to be singularly preoccupied with collecting great volumes of recyclables but can instead focus on providing quality waste management services. Those who had previously worked as informal recyclers shared that their monthly earnings varied widely depending on the amount of materials they could collect and the fluctuating market prices for selling collected materials. Informal workers at the city landfill revealed a similar preoccupation, as they are forced to sell to middlemen who offer lower prices than the formalized recyclers receive. Despite the assurance of a steady wage, many recyclers are severely affected when the municipality does not pay them on time. One recycler lamented, for instance, that her Christmas holidays had been “horrible” due to the fact that she had not been paid on time and thus had not had any money to buy gifts for her husband and children (Recycler 18, age 35).

On the other hand, many recyclers identified several ways in which their small businesses could be made more profitable and less dependent on wages from the municipality. At present the profits earned from selling the recyclable materials only cover the capital costs of running the

microenterprises. Some of their ideas for increasing revenue (some of which were inspired by CS projects in other cities) include expanding service to other areas and neighbouring municipalities, producing and selling new goods from the collected recycled material (such as egg cartons from recycled paper) as well as the production and sale of compost. Combining initiative and their expanding capabilities, the recyclers appear to have the potential to turn the microenterprises into a more profitable and sustainable RWM system.

To be able to participate in the life of the community

With regard to the recyclers in Pucallpa having the opportunity to participate in community life, the results of the RWM project are twofold. Not only have the recyclers been given the opportunity to create their own community via the microenterprise structure, but they also experience an increasing sense of the local community members opening up to them, supporting their activities and allowing them to participate in important decision-making processes. Community can be understood in this context as it is commonly defined in the social sciences “as a place,/.../as relationships, and/.../as collective political power” (Gusfield, 1975; Heller, 1989; Suttles, 1972 in Chavis & Wandersman 1990:56). The benefits of greater involvement in the community are important for development practitioners to consider. Although illiteracy and lack of health services are detrimental to a person’s well being, so too are “many other conditions such as social and political oppression that restrict one’s participation in the life of a community” (Fukuda-Parr 2003:307).

The creation of a ‘community of recyclers’ was never implicitly stated as a CS project goal or objective, but the camaraderie and solidarity that has been built amongst the formalized recyclers in Pucallpa is still a palpable project benefit. One of the microenterprises stood out as having an exceptionally supportive and friendly working environment. One recycler shared that the best thing about working at this microenterprise is that “everyone are friends, we can talk and have a good time, we all are united” (Recycler 6, age 29). Another recycler even went so far as to describe the microenterprise as his ‘family’, telling us about a time when he was in the hospital for a few months and the recyclers got together to help him pay some of his medical bills (Recycler 22, age 56). These recyclers have made considerable investments of time and effort in working with their microenterprise and the majority state that they plan to continue working there into the future. Additionally, the lower-level recyclers have a good relationship with the managers and they commonly describe their working environment as being ‘democratic’ and

‘fair’. The benefits of this sort of group behaviour are a stronger sense of belonging and solidarity among the recyclers, and this appears to be contributing to increasing levels of human development throughout the group.

Beyond the relationships among recyclers who work together daily, CS encouraged the creation of a larger community of recyclers in an effort to promote cooperation amongst the microenterprises. At the beginning of the project, CS donated several critical pieces of machinery to be shared amongst the microenterprises leading them to form an association of recyclers, ‘*Tierra Colorada*’, whereby they work together to collectively plan shipments of materials to Lima, to solve common problems, and to share ideas and resources. It is also very apparent that the recyclers rely on each other for more than business purposes; rather they have built relationships based on common interests, common goals, and the desire to create lasting bonds of friendship. As a result of these relationships, the recyclers have experienced increased levels of workplace security (meaning that they can rely on one another for work-related assistance) and greater influence amongst community members and the local government. For instance, we noticed how the recyclers came together after their contracts expired to pressure the municipality to renew their contract and to pay them the wages that were owed. The municipality was open to hearing them speak and agreed to grant them a short contract over the Christmas holidays. A CS staff member agreed when we inferred that the municipality would not have been as willing to hear the recyclers speak had they not been able to present themselves as a unified and organized group.

The creation of formal microenterprises has also opened doors for the recyclers to actively participate in community life. As most of the recyclers live in the same communities where they work, they are constantly interfacing with the residents in both personal and official capacities, allowing them to build strong social bonds and networks. Several recyclers used these networks when introducing us to members of the IHS administrative councils with whom they communicate regularly in their work within the microenterprises. These recyclers appear to be well informed about the decision-making processes within their communities and are genuinely interested in seeing their communities improve. One leader of an IHS commented on the power of the recyclers’ presence in the community saying, “They are the ones working in the community, we [the administration] are in offices, they are in a position to work for change” (IHS respondent 3, age 39).

Beyond the local community, the recyclers are also seen participating in governance of the RWM systems both in Pucallpa and nationally in Peru. Because of their formal status the recyclers have collectively gained access to dialogue with the municipal government and have a strong voice in negotiating service contracts. Additionally, the recyclers' participation in governance issues has extended to the level of the federal government with their inclusion in creating a countrywide recycling law that regulates the activities of formal recyclers and their municipalities (Ministerio del Ambiente 2009b). In November 2009, six recyclers from Pucallpa traveled to Huancayo, to attend a conference of recyclers from across Peru to discuss and help formulate the law's components.

Oral history: Marianna⁹

To follow is a presentation of the oral history of a recycler whose experience is not uncommon amongst our research subjects. Her story exemplifies how all four of her human capabilities have been impacted as a result of her participation in the CS project. Her story also suggests how these effects can lead to sustainability:

We watch as Marianna pads across the single room of her house, to a corner where her two-burner gas stove and a basin full of plastic dishes make up a small kitchen. She dips two glasses into a pot filled with boiled pineapple rinds and offers us each a cup. We sit on the bed her two young sons share and sip the weakly sweet drink. Marianna, 28, lives with her husband Pablo, 29 (who is also a recycler), and their six and eight year old boys in an IHS outside of Pucallpa. Their house is made of crudely cut wooden slats and has a roof made of sheet metal and plastic. They live on the outer edge of their neighbourhood, where the majority of houses are built on stilts above the marshy tropical river delta. Marianna is telling us about her life in Pucallpa and how a few years ago she used to sit at the market selling used clothes, beauty products and gasoline. "Occasionally I would go with my neighbour to the dump to look for recyclables when I needed extra money", she says, "but I didn't like it at all. I would get bad stomach aches."

"One day a community leader came to me because he knew that I needed work and told me about an opportunity for a steady job", she says. Marianna goes on to describe how she went to a meeting in the city centre and spoke with members of CS who explained to her their plans of starting a small business to collect solid waste in her community. She was soon hired and asked

⁹ Names have been changed to provide anonymity

by CS to become one of the managers of the new microenterprise. As she speaks she proudly shows us things that she has rescued from the trash: several working mobile phones, purses, toys, and a fan.

“It wasn’t long before I started making money, and I was very happy to have my *own* income to spend rather than having to ask my husband for money”, she says. “I have been able to make enough money to support my family alongside my husband and to buy some things for the house.” She slowly learned how to use the tricycle waste carts and got used to following the routes through the neighbourhoods. “It was difficult at first”, she remarks, “the tricycles were very heavy and hard to manoeuvre, especially during the rainy season. The tricycle would often fall over. We had a lot of trouble covering our entire route, and often did not finish in time. Since 2007”, she continues, “we have been covering our route regularly and keeping the neighbourhood clean!”

Marianna is assertive and articulate - a natural leader. She laughs easily and is constantly making jokes. Her role as administrator of the association which oversees all of the recycling microenterprises in Pucallpa, is well deserved. But Marianna begins to share her apprehensions about the future. She fears for when CS leaves them to run the microenterprise on their own. “Sometimes it doesn’t feel like we know how to start thinking of the microenterprise as our own instead of a ‘gift’ from CS”, she comments, “but I plan to continue working for my microenterprise for a long time and I want to help improve the business and make it more successful.”

As she concludes her story, Marianna insists upon one thing, “I prefer my life now to my life before the microenterprise. My life before was boring. I had no challenges. In the microenterprise I learn something new every day, meet new people and make my own money.”

Sustainability

According to the universalism principles that influence the sustainable human development paradigm that guides this research, “It is particularly important to place concern about equity in the contemporary world and equity in the future in a generally integrated framework” (Anand & Sen 2000:2040). Throughout our data collection process in Peru, we identified various areas where RWM is actively promoting sustainability and equality between present and future generations. The following discussion results from our iterative process of data collection and

analysis whereby themes emerged that were outside of the human capabilities but were found to be particularly relevant to sustainability. Above and beyond the project results expected to influence sustainability discussed in the above analysis, implications involving important topics such as gender, education and political and legal structures are expanded upon below.

Gender

The microenterprises are an inclusive employment opportunity for people from all sections of society incorporating various ethnicities, socio-economic backgrounds and ages. We noticed however, that the previously marginalized female recyclers are in particular the group who are most obviously empowered by their newfound ability to support themselves and their families. With regard to entry-level positions, we found that a nearly equal number of women are employed in the microenterprises as men. Concerning managerial positions, even more women than men were employed above entry level and a fair amount of them, not technically considered managers, seemed to take on unofficial leadership roles on a daily basis.

Interestingly, although many women are employed in the microenterprises and the majority of managers are women, this gender-friendly project result is not an intended outcome written explicitly in any of CS's project documents. Rather, the increase in females attempting to make economic contributions to their households in Pucallpa might be the result of a trend of sharply increasing female labour force participation throughout Latin America (Buvinic et al 2008:59). Indeed, we noticed that women represent a large portion of the general workforce in Pucallpa, and their involvement in the local economy is blatant.

We spoke with one particular female recycler about how grateful she is to CS for providing her with the opportunity to work in a formalized setting (Recycler 18, age 35). This woman, married with five children, describes herself as "a newly independent woman who doesn't have to depend on a man" and revealed to us that women in Pucallpa were previously lacking the opportunity to get involved in the formal sector. Rather, they often worked selling food, beauty supplies or other material goods informally. When given the choice, the trend followed that women working for the microenterprises were more satisfied with their employment than they had been before and that they felt that they were contributing to the well being of their families and society as whole.

Moreover, women have often been characterized as the key change-makers at the household level insofar as to target women as the primary models of behaviour, is to advance effective knowledge and skill transfer within the domestic sphere and beyond (UNDESA 2005 cited in O'Reilly 2009:4). Certainly, since the United Nations Conference on Environment and Development (UNCED) in 1992, the role that women play in “promoting a different type of development that is socially, economically and environmentally sustainable” has been acknowledged with increasing enthusiasm (Corral n.d.:7). Presenting women in Pucallpa with equal opportunities to build their capacities and contribute to improving local society in the present and for the future has undoubtedly been a key factor in the success of the CS's RWM project, and in promoting a universalist and holistic form of sustainability on a grander scale.

Education

It is clear that there is a general lack of awareness among residents of the IHSs regarding the dangers of improper waste disposal to environmental and human health. We commonly saw people littering and often found garbage dumped indiscriminately in various places throughout the communities. Trash could still be seen floating in the foul smelling rivers and streams. The fact that many people told us that these areas are cleaner than they were before the microenterprises began working in the IHSs tells of the great changes that still need to occur before environmental protection reaches a state that anyone would consider sustainable. Change happens slowly and we saw a clear disconnection between what people know and believe and what they do. Indeed, CS believes in order for solid waste management in Peru to improve in a sustainable fashion, what is needed above all else, is “education, education and more education” (Ruiz Rios et al. 2009:6).

On several occasions we also witnessed recyclers who are undoubtedly knowledgeable about waste and the environment, tossing small pieces of litter onto the ground. The same can be said of residents whom we spoke with who claim that they value the work that the recyclers do in their communities but admit to dumping trash into the streets or in the local river if the recyclers do not pass by to pick up their garbage on time. One CS employee believes that in the IHSs, unsustainable practices of dumping and littering are less likely to occur if people have a better alternative – such as regular waste management services - and if these habits are considered to be

unacceptable behaviours by both by individuals and society as a whole (CS respondent 4, age 28).

Hence, the recyclers can be seen as environmental advocates and change agents promoting these kinds of changes in the IHSs. As the recyclers pass on a message of environmental sustainability through dialogue in their community council meetings and through incidental encounters with the homeowners on their collection routes, they are increasing the human development of the rest of the community. Education about RWM can be seen being passed on to the next generation through various school recycling programmes initiated by CS. In fact, we witnessed an environmental awareness day in Pucallpa when hundreds of elementary and secondary students from across the city enthusiastically paraded through downtown carrying signs with environmental messages and wearing costumes made of recycled materials. On another occasion, we saw the son of one of the recyclers arrive at the recycling centre dragging a huge bag of plastic bottles that he had collected from his school. His mother explained that the microenterprise buys the bottles from him and he gets to keep the money for himself. In these ways we see education and sustainable practices being transferred effectively.

Political and legal structures

In order for the RWM system in Pucallpa to promote equity and be sustainable into the future, it appears that government support will be a key factor. An integral element of all CS projects is that RWM systems be inclusive of a variety of stakeholders. As one CS staff member said, “We are working with municipalities to include microenterprises in negotiations and it is important that we communicate with the government and the public to bring the issues of the lowest [people in society] to the top” (CS respondent 1, age 42). CS initiatives do not venture to affect the lives of the recyclers and the communities where they work without also working hand-in-hand with the government to improve broader policies on waste management.

In Pucallpa, the microenterprises have been working closely with the municipality and at present they are highly dependent on municipal support to provide a service contract and regular wages. However, the recyclers still feel they must advocate for their work in convincing the municipal authorities to see waste management as a necessary public service worthy of continued funding. As one microenterprise manager stated, “We keep having to present to the municipality where the service is most needed, which zones are important to support, which people need the service.

They [the municipality] believe that the informal settlements are not as important [as the city centre]” (Recycler 18, age 35).

Increased knowledge and awareness, combined with the benefits of living in cleaner environments, gives us reason to believe that the people of the IHSs of Pucallpa will be concerned with seeing RWM services continue in their communities. Indeed, the vast majority of residents we spoke with want to see the microenterprises continue servicing their communities. Several respondents stated that both the recyclers and the residents need to work with their community representatives to persuade the government that waste management services be part of the political agenda and funding for these activities be sustained. This sentiment was passionately displayed by one recycler saying, “The community needs to support us. They are too peaceful. They need to pressure the municipality - many do not care enough!” (Recycler 30, age 28).

Congruous with this issue is that the citizens of Pucallpa need to be willing to pay taxes so that funds will be available to go to support this system. A number of respondents spoke of how many people throughout Peru have an aversion to paying taxes and how it is thus very common for informal settlements to be excluded from regular municipal services. In these ways the RWM initiative is contributing to the equity of IHSs by encouraging the government to address environmental issues and the needs of the poor in the poorest areas of the city and at the same time teaching the IHS residents to become engaged in the formal civil structures.

The cooperation between recyclers from CS projects and similar organizations throughout Peru and the government has also led to recyclers playing an important role in creating the aforementioned Peruvian Law 29419: *La Ley del Reciclador* (the Recycler’s Law) (Ministerio del Ambiente 2009a). This new law will serve to protect the rights of formalized recyclers by regulating their work and mandating municipalities to support their role locally (Ministerio del Ambiente 2009b). This is an important step in recognizing the legitimacy of recycling as a livelihood activity while regulating the conditions necessary for recyclers to continue their activities. The proposed law also mandates the implementation of incentive systems aimed at increasing public participation in recycling¹⁰. The implementation of the new Recycler’s Law

¹⁰ An incentive system had, several years ago, been implemented in Pucallpa offering tax discounts for people who separate their recyclables from household waste and some respondents believe the success of such programmes has resulted in vastly improving rates of participation (Recycler 1, age 45; Municipal respondent 1, age 58)

should be effective in promoting long-term viability and sustainability of improved recycling systems thus increasing the associated benefits to human development now and into the future.

CONCLUSION

Through an analysis of collected data from a SHD perspective it has become clear that the implications of RWM systems reach far beyond improving the lives of the recyclers, to positively impacting the larger community of which they are a part. Consequently, our most relevant finding is that RWM projects have significant potential to improve the lives of individuals, while addressing sustainability amongst and between generations. Hence, we present lessons learned from our case study and conclude with a discussion of various implications for SHD theory and for future similarly modelled development initiatives.

First of all, it is clear that CS creating a source of formalized recycling employment in Pucallpa resulted in several positive outcomes for the recyclers related to physical and mental health. Certainly, we saw that the microenterprises are providing relatively safe and healthy working environments, especially when compared to the conditions that their informal counterparts are experiencing. More evident, however, is the impact that the provision of formalized and dignified employment opportunities have on the recycler's mental health. Improved mental health related to increased job satisfaction, social acceptance, dignity and lower levels of stress lead the recyclers to feel happier, better accepted within their communities, and a great deal more confident. In turn, the recyclers are better able to represent themselves within the community and pursue other opportunities that could further increase their well being.

Secondly, the fixed and steady wages the recyclers earn are very important to their sense of financial security. This income allows them to consistently meet their basic needs and reduces feelings of employment insecurity typically associated with informal recycling. Although it was fairly uncommon for the recyclers to be able to save for the future, there were instances where they earned enough money to even pursue other opportunities such as post-secondary education. The recyclers able to take advantage of this possibility are investing their earnings in further building their capacities and increasing their human capital.

CS and their system of job training within the microenterprises has been effective in equipping the recyclers with the skills to perform their jobs effectively as well as with appropriate knowledge of environmental issues facing their communities. As a result of the recyclers

increased capacities they are empowered to advocate for the environment and the importance of their work with members of their communities, municipal authorities and national lawmakers. In this way, they can be seen as agents of change, entrusted with the duty of promoting sustainability both locally and nationally.

In summary, the RWM system in Pucallpa can be seen as a step in the right direction towards ‘closing the loop’ of resource use and creating more sustainable environments (Gutberlet 2008:14). Recyclers participating in initiatives similar to these must be seen as playing an important role in protecting the environment and at the same time reducing demand for materials from raw natural resources (ibid.). CS, through the creation of recycling microenterprises in impoverished areas, is expanding equity by creating desirable employment opportunities for the poor and marginalized in Pucallpa and at the same time contributing to transforming the IHSs into healthier living environments for future generations.

Finally, the RWM system in Pucallpa offers several important lessons for similar holistic development projects that target both human and environmental beneficiaries. First, delivering appropriate educational campaigns at all levels of society is of vital importance. All potential project participants and beneficiaries need to be educated about the risks associated with improper disposal of waste and the various ways they can contribute to making their neighbourhoods cleaner and healthier places to live. Secondly, RWM systems must be equally inclusive of gender and should further reach out to other marginalized people. Thirdly, public policies need to support the integration of recyclers and recycling into the waste management system. The formal integration of recyclers utilizing low-technology methods of waste collection and separation is a cost effective solution to both environmental and social concerns. Sustainability of equitable social conditions and healthy natural environments can only be achieved if they are both considered as equally important in development planning.

Successes in the RWM initiative in Pucallpa show that multidimensional projects targeting both human development and environmental issues can and should be the direction of future development interventions. This study has implications for development theory in showing that the creation of environmental service jobs not only contributes to the SHD of those employed but also benefits the wider community by protecting local ecosystems for future generations. Furthermore, we found that formalization of employment played a profound role in expanding

the recyclers' well being and thus assert that our investigation may hold significance for further studies investigating the role of formalization in similar holistic development initiatives.

According to Mahbub ul Haq (1995:1) one of the founders of the human development paradigm, "The most difficult thing in life is to discover the obvious." Indeed, the potential for development initiatives that focus on human needs and environmental health in unison may be both obvious and influential on profound behavior change.

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APPENDICES

Appendix A: Ciudad Saludable project objectives

1. Engage 45 families in solid waste recycling have improved their health and working conditions and are formalized by the establishment of a local association, and recognized by the municipal authority.
2. Establish 45 recyclers with the loan fund and monitor that the loan is paid back in a timely fashion
3. Establish a collection center for recyclable waste operating safely and with quality service for the recyclers in the city of Pucallpa
4. Establish a program of segregation of solid waste from the source (households, corporate offices, educational institutions and others) with active neighbourhood participation and local benefits to the residents committed to the tasks of the program.
5. Establish an optimized system for solid waste collection using unconventional technology. The re-useable waste pickup shall be performed by formal recyclers.
6. Train and sensitize the population in solid waste management and environmental care, modifying their habits and behaviours in including adequate separation and minimization of waste, reducing health risks to the formal recyclers
7. Implement other activities related to the project:
 - a) Hold meetings and make proposals to local private companies
 - b) Develop and maintain a blog on the Internet for the project
 - c) Follow up implementation of the landfill in Km 22
 - d) Support the San Francisco Saludable project
 - e) Systematization Project/Coordination between different project actors

Appendix B: List of respondents

Recyclers (27)

Respondent	Age	Sex
Recycler 1	45	Male
Recycler 2	33	Female
Recycler 3	39	Female
Recycler 4	34	Female
Recycler 5	17	Male
Recycler 6	29	Male
Recycler 7	33	Male
Recycler 8	56	Male
Recycler 9	60	Male
Recycler 10	62	Male
Recycler 11	42	Female
Recycler 12	24	Male
Recycler 13	21	Male
Recycler 14	49	Male
Recycler 15	35	Male
Recycler 16	65	Male
Recycler 17	22	Male
Recycler 18	35	Female
Recycler 19	29	Female
Recycler 20	46	Female
Recycler 21	31	Male
Recycler 22	56	Male
Recycler 23	38	Female
Recycler 24	39	Male
Recycler 25	29	Male
Recycler 26	28	Female
Recycler 27	40	Male

Informal recyclers (9)

Respondent	Age	Sex
Informal recycler 1	29	Male
Informal recycler 2	18	Male
Informal recycler 3	42	Male
Informal recycler 4	24	Female
Informal recycler 5	25	Female
Informal recycler 6	22	Male
Informal recycler 7	39	Male
Informal recycler 8	56	Female
Informal recycler 9	45	Male

Informal housing settlement (IHS) representatives (7)

Respondent	Age	Sex
IHS representative 1	29	Male
IHS representative 2	47	Male
IHS representative 3	39	Female
IHS representative 4	56	Female
IHS representative 5	54	Male
IHS representative 6	46	Male
IHS representative 7	50	Male

Ciudad Saludable (CS) staff/volunteers (4)

Respondent	Age	Sex
CS respondent 1	42	Female
CS respondent 2	24	Male
CS respondent 3	21	Female
CS respondent 4	27	Female

Municipality of Pucallpa staff (3)

Respondent	Age	Sex
Municipal respondent 1	58	Male
Municipal respondent 2	59	Male
Municipal respondent 3	62	Male

Appendix C: Interview guide for recyclers

General

1. What was your profession before you became an employee for one of Ciudad Saludable's microenterprises?
2. How long have you been working for the microenterprise?
3. Why did you start working for one of Ciudad Saludable's microenterprises?

Life satisfaction and health

4. How do you feel about your work?
 - *Are you proud of your job?*
 - *Do you feel happy working for the microenterprise?*
 - *Is your microenterprise a desirable place to work? What makes it so, or not so?*
5. How are the working conditions in your microenterprise? (Compare to informal recycling work if applicable)
 - *Has your physical health improved or deteriorated since you began working for the microenterprise? How so?*
6. Does working for the microenterprise make you feel as though you belong to a specific social group or community (i.e. of recyclers)?
7. How do you, as a recycler, contribute to the community in which you work?
8. How does the community impact your work? Setting, participation, support?
9. For the length of time you've been working for the microenterprise, have you noticed that the areas you service are much cleaner and safer than areas not serviced by one of the microenterprises? If no, why not?
10. Do you feel that working for the microenterprise has allowed you to fulfill your basic needs as well as the basic needs of those depending on you?
 - *If no, why do you keep working for the microenterprise?*
11. Do you feel that working for the microenterprise increases or decreases your self esteem? How so?

Knowledge and skills

12. What skills do you have now that you didn't have before? How have you learned them?
13. Has working for the microenterprise furthered your education/general knowledge level in any way? How?

14. Has working for the microenterprise made you feel more aware about local and/or global issues? If so, which ones and in what way?
- *Has working for the microenterprise changed your opinion on the importance of recycling and environmental conservation? In what way?*

Standard of living

15. Has there been a noticeable change in your income level as a result of working for the microenterprise?
- *Are your wages steady/consistent?*
16. What could be changed/improved in the microenterprise that could help increase your wages?
17. What are your plans for the future?
- *Do your plans for the future involve the microenterprise?*
18. Do you feel that working for the microenterprise has improved opportunities for you and your family to progress? In what way?
19. Are you saving money for the future?
- *What kinds of things do you save for?*
20. Do you feel that your job at the microenterprise is secure/permanent?
21. Do you have ideas/opinions about how the microenterprise could be more successful and sustainable?
- *Are there opportunities for you to express these opinions?*
22. What is the best thing about working here?
23. What is the worst thing about working here?
24. Who has the most power in the success and failure of your microenterprise?
25. How important do you think it is to have support/cooperation with the municipality?
26. Do you think that your microenterprise can be successful without their help/provision of wages?

Other

27. What do you see as the main benefits of the microenterprise structure?
28. What advantages are there in working as a microenterprise as opposed to an association? vice versa?
29. Is the microenterprise system of waste management a long term solution for cities like Pucallpa.

