form of money and manpower, as well as western ideas and notions. Anantharaman (2014) states that Bangalore's middle and upper classes, perhaps the most susceptible to Western ideals, contribute mainly to the waste management problem in Bangalore. In addition, Anantharaman (2014) believed that education and behavioral reforms should be at the forefront of solving the waste management crisis in Bangalore. Perhaps the first thing any newcomer to Bangalore will notice is these piles of garbage, often set aflame, to make room for more garbage to be dumped. In fact, Bangalore produces, on average, 3,000 tonnes of waste per day.

While civic authorities have failed to address this infrastructural issue, a number of civil society groups are leading the campaign to make the city clean. An important leader among civil society groups is the Environmental Support Group. Located in Banashankari II Stage, Bangalore, Environmental Support Group has worked diligently with the Bruhat Bangalore Mahanagara Palike (BBMP), the city's body of government dealing with civic infrastructures, as well as other NGO's, since the early 1990's to bring about change in the state of waste management in Bangalore. Through their campaign on waste segregation and better working wages for waste pickers, they have brought a new conversation of waste management in the city. My research explores the work of this organization and:

1. How has Bangalore's history of rapid urbanization affected waste management systems in Bangalore, if at all?
2. How can sustainable waste management practices be introduced in this mega city through decentralized processes especially through people's participation and civil society engagement?

Through Environmental Support Group's interventions, Bangalore has seen a dramatic increase in awareness and knowledge of waste management issues in Bangalore, and Environmental

Support Group is still working persistently to create more meaningful, impactful, intentional strides in the field of waste management. Through efforts in the form of educational reforms, public posters, commercials, trips to schools, and even Public Interest Litigation cases, Environmental Support Group has created meaningful change in the field of sustainable waste management.

Literature Review

NEW MIDDLE CLASS AND CULTURE OF WASTE PRODUCTION

Anantharaman (2014) argues that due to India's nature as a globalizing country, it is experiencing much of the West's influence with little of the West's failsafe measures. Intensifying resource usage across the nation is leading to increased ecological harm, and Ananthataman (2014) argues that a critical analysis of modern Indian culture with an emphasis on questioning its westernization is necessary to ensure sustainability and stability. Ananthataman (2014) also weaves together the issues of sustainable waste management,

them susceptible to Western ideas and practices. This, combined with Bangalore's perceived lack of infrastructure, leads to an overabundance of municipal solid waste. In order to more sustainable manage waste, Ananthataman (2014) argues that behavioral changes are at the forefront of the battle. This has been executed extremely well by Environmental Support Group, through their efforts to educate the public and to form ward committees to further enforce proper, sustainable behaviors.

WASTE PROBLEM IN BANGALORE AND IN INDIA

Bangalore's problems with regards to waste management are not unlike other Indian cities' problems. Annepu (2012) compiled information for two years, and detailed current waste management systems in India, their affects on public/environmental health, and further, proposes new sustainable waste management systems. This report also catalogues the hierarchy of sustainable waste management, details the status of current waste handling practices in India, and takes into consideration public health/safety, water pollution, soil pollution, and climate change.

Annepu (2012) suggests a holistic approach to waste management: solve current problems utilizing social science and natural science tools, while working towards prevention of further complications in the future. In the past, waste was never an issue because everything used in India came form the earth and was fairly bio-degradable. In addition, people would use every bit of a resource before throwing out any inert materials. With the advent of plastics and the view of plastic as a "western ideal," municipal solid waste has greatly increased but the recycling and dry waste management practices in India have not developed as rapidly as consumption patterns.

As Annepu (2012) suggests, India has four options: 1) Address solid waste management as an overall issue, 2) Reduce municipal solid waste's impact on the environment and on public

(2015) analyzes and critiques modern waste management techniques in Bangalore and in India as a whole (including door-to-door collection and segregation), and looks at policies and regulations regarding waste management.

Door-to-door collection and segregation, as well as decentralized waste management systems, have been especially effective in the case studies conducted by Singh (2015). Some wards even managed to achieve zero-waste, and zero-landfill, status (Singh, 2015). When the ward committees (or comparable entities) are effective and efficient in their educational efforts and the actual waste management, the cities/villages benefitted greatly (Singh, 2015). These efforts are being mirrored by Environmental Support Group and their efforts towards creating truly sustainable wards and ward committees.

Waste management is more than advanced technologies and energy production; education, legislation, and the social/cultural side of the issue also need to be taken into account. Tripathy (2015) details various regulations that should be put in place in India, in order to get a bet

Improper waste management doesn't just lead to insect infestations; stray dogs, an issue across many developing countries, is only exacerbated by improper waste management. In Srinagar, the summer capital of the state of Jammun & Kashmir, the stray dog population has increased, correlated with an increase in roadside trash, an important food source for these stray dogs (Annepu, 2015).

Improper municipal solid waste management can lead to innumerable public health issues, many of which will lead to a "domino effect" and will snowball into each other, creating massive public health issues. Public protests have been moderately effective, but large-scale overhauls of the waste management systems across India will be required before significant headway can be made. Education and decentralization have proven effective in the past (Annepu, 2015).

CITIZENS' ISSUES

Waste management is as much a city's issue as a citizen's issue. The people's ways of

societal scale. This is important research, because it specifically targets Bangalore. Bangalore generates 3000 tonnes of waste per day, 70% of which is organic; by restructuring the waste management system from every aspect – including the household – organic waste and non-organic waste can be significantly reduced. This waste generation is extremely indicative of the western patterns of consumption perpetuated by consumerism and capitalism (Devadula et al., 2015; Anantharaman, 2014).

Caste also comes into play when discussing waste management in India. George (2014) recounts a journalist's experiences exploring how caste and waste management are intertwined, mostly by examining Dalit occupations with relation to waste management and removing human excrement. George (2014) precisely analyzes how caste structures have hindered the evolution of sustainable waste management in India. According to George (2014), we must first restructure caste's role with relation to waste management. By legitimizing and incentivizing this work, dignity and humanity will be restored to the job and the caste, and waste management at that level will greatly improve. Due to casteism in the past, certain castes, specifically those that work with waste, are looked down upon in society. They are seen as lower than the lowest because they with trash and human/animal waste, which dehumanizes both that caste and those jobs. This dehumanization, coupled with rampant consumerism and capitalism, leads the Indian middle and upper classes to see waste management as a problem for the "other" to deal with (George, 2014).

However, it is also important to note that caste structures have already changed in much of urban India. As foreign trade and economics become more and more relevant, the idea of class vs. caste has begun to emerge. Although both still play large roles, urban Indians are often places in a societal hierarchy based on economic class (wealth, income, etc.) rather than traditional caste (based on traditional Hindu beliefs). With this advent, the intersections of class, caste, and

technology add the unique burden to certain individuals in urban India of having to navigate their caste being subverted by their class, yet still having to survive with or without technology depending on the situation (George, 2014).

Waste management, citizens' issues, and casteism, also tie into environmental concerns. Nagendra (2012) successfully established an introductory structure as to how and why sustainable waste management is important. By cataloguing "A Tale of Two Lakes," the story of how damming lakes/rivers in and around Bangalore has led to increased water shortages and has instigate water pollution, Nagendra (2012) analyzes the effects of unsustainable waste management and launch into citizens' rights movements with regards to water and waste.

Although Environmental Support Group primarily works with waste management legislation, much of their work has focused around lakes and water bodies, as these are greatly affected by improper waste management. Lakes in Bangalore have undergone much pollution in recent years, which has greatly affected the migration and reproductive patterns of local species of birds and reptiles that live in/near these lakes.

Research Questions

In order to guide the framework of my independent field research project, I focused on the following questions when conducting my literary research and when structuring my interviews :

1. What are current sustainable interventions with regards to waste management that are currently happening in Bangalore?
2. How has Bangalore's history of rapid urbanization affected waste management systems in Bangalore, if at all?

3.

interviewed three senior members of Environmental Support Group

This heavily impacted communities near these landfills, who still continue to suffer to this day (Rao, 2016). In fact, even still today, waste is dumped in/around communities without the wherewithal to fend for themselves (Saldhana, 2016). More often than not, wealthier communities are “cleaner,” while poorer communities are where the landfills are located (Saldhana, 2016). Even the solid waste workers are not safe from harm, as they often work without health safety materials and are treated unfairly by employers and contractors by means of delayed paychecks and restricted/minimal health benefits (Iyer, 2016).

However, in order for these structural conditions to improve, much work remains to be done. First and foremost, ward committees need to organize more intentionally and efficiently to properly manage their waste. This will resolve both waste management issues and urban governance issues (Iyer, 2016; Rao, 2016; Saldhana, 2016). In addition, the Bruhat Bangalore Mahanagara Palike needs to assure that there are dry waste collection centers and composting units that are accessible to all wards. The benefits should reach all of the city, such as providing compost for community gardens, kitchen gardens, plant life lining streets, etc., in part so that wards feel a sense of pride and continue to pursue sustainable waste management (Rao, 2016).

In the past, the policy environment in Bangalore was fairly restrictive; it was hard to get things passed as a concerned citizen, and those in power only seemed to be concerned with remaining in power (Saldhana, 2016). However, more recently, people have begun to realize that waste management is an issue that affects everyone regardless of caste, class, or gender. Most major policy changes as of late have been centered on recycling and producer responsibility (Rao, 2016). Hopefully this pattern of consumer responsibility and producer responsibility will continue to create a truly sustainable waste management system in Bangalore.

An Overview of Environmental Support Group

Located in Banashankari II Stage, Bangalore, India,

can help to ensure the health and safety of those in Bangalore for generations to come. In addition, by recovering resources first and making it a priority, maximum resources are recovered, meaning maximum resources can be utilized for energy generation, composting, or other waste management initiatives. When resource recovery is an afterthought, not every resource is recovered. In addition, as an afterthought, it is hard to retrofit waste collection methods; as a praxis, these methods are designed with resource recovery in mind.

there are 18 functions of wards, including fire management, waste management, and lake management, but there are no concrete protocols as of yet (Saldhana, 2016).

One of the main tenants of effective sustainable waste management, in Environmental Support Group's eyes, is the decentralization of power among municipal solid waste collectors and processors. Environmental Support Group believes that decentralization will be the most effective methods, because centralized waste management is inherently flawed in Bangalore. In the past, one organization controlling all of the waste would rarely pick up the waste, and when they did, it would just be shuffled from one place to the next. A decentralized system, where the responsibility to manage waste is ultimately in the people's hands, puts the responsibility on them, thus ensuring that waste is managed effectively. As a result, 198 municipal wards were created. Each ward is charged with managing their own waste to the greatest extent possible,

However, there is a small deal of controversy and perplexity surrounding dry waste collection centers. In an interview with one dry waste collection center, the Environmental Support Team and I learned that even though that particular dry waste collection center was situated in Badmanavhanagar, it was the designated collection center for Hosakere Halli. More often than not, dry waste collection centers are not situated in the ward that they serve, making it difficult for the dry waste to reach its designated collection center.

Various different organizations run these dry waste collection centers, ranging from non-governmental organizations to the BBMP (Bruhat Bangalore Mahanagara Palike, the governmental organization responsible for civic infrastructures in Bangalore) to private organizations. Depending on which organization is training you, you may or may not be equi24 143.2305 40.2 (ure) 0.2 (s4yr2) 0.2 (n8u2 (re) 0.2(a) 0 (q0.2 (a) 0.2 (l)r2)ur5g 0 50 0 0 T w)-0.2 (a) 0.2

The longer that the ward system is in place, the more that the public is beginning to realize t

Waste Segregation In Bangalore

One of the main functions of wards is to make the segregation and subsequent processing of waste much more manageable and efficient throughout Bangalore. Although the idea has been around for a few years, Environmental Support Group gave waste segregation the final push it needed to become mandatory across Bangalore (Saldhana, 2016). As the push for waste segregation has increased, the BBMP and the Pollution Control Board have both endorsed the program and have made plenty of efforts to allow for segregation of waste city-wide (Iyer, 2016). In a city in Northern India, Environmental Support Group actually demonstrated how waste segregation can be a successful and useful tool to mitigate improper waste management using a ground-up approach. By breaking down a complex problem into manageable pieces (creating ward committees) and situating them all together with the tools to combat it (education and waste segregation), people begin to understand the issues and why/how those i0.2 (s)csues impact them (Saldhana, 2016).

In fact, the reason that Environmental Support Group garnered so much attention for waste segregation was because Environmental Support Group was instrumental in the shutting down of the Mavallipura landfill, mentioned earlier. With the land, air, and water within and surrounding Mavallipura being so contaminated, Environmental Support Group was successful in shutting down the Mavallipura landfill and bringing attention to this quite pressing issue.

Perhaps the largest benefit to segregating waste at the source is the potential to provide power to the city, and compost to local farmers. Dry waste is often recycled, and bio-medical and

engaged with solid waste management typically operate under strict laws and are somewhat limited in what they can change policy-wise (Ahmed & Ali, 2004). Additionally, much of the public sector's work regarding solid waste management includes street sweeping, and manually handling waste and cleaning drain

not always visibly present in some “Western” waste management systems, are important stakeholders in some “Eastern” waste management systems. Many waste pickers make their livings recovering and selling materials which then go on to become many important technological goods that run the world’s economy.

Solid waste management is a challenge in many urban areas especially considering increased rates of waste production and rising populations, which places additional stress on municipal budgets (Guerrero et al., 2013). In solvi

India, “dalits” (“untouchables”) are historically waste pickers through the caste system, and the “dirtiness” of handling waste has led to a sentiment against waste pickers (Schienberg & Anschtz, 2006).

Through modernization, waste pickers may become obsolete or a necessity – if landfills

wards and ward committees, and do their best to ensure both producer and consumer responsibility. Moving forward, the biggest challenge will likely be changing the culture surrounding waste in Bangalore. The influx of consumerist culture, coupled with one-time use items such as soda and water bottles, plates, utensils, etc., as well as tetra-packs, lead to grave accumulations of waste.

With the interventions of Environmental Support Group, Bangalore has been improving its waste management policies for the past few decades. The formation of wards and ward committees has greatly improved the condition of waste in Bangalore, and although much remains to be done, there is also much to be proud of.

Much research remains to be done into the successes of segregating waste. How much waste is segregated properly? Do bulk generators follow the guidelines set out for them, which are different from residential and other generators? What is the reason more people are not more supportive, or more aware, of the waste management issues affecting Bangalore? These questions, and more, must be answered and critically envisioned before more work can be done towards truly sustainable waste management.

Although Environmental Support Group and I worked well together, there were shortcomings and gaps in my research. For example, since I needed about a week to get caught up on the current state of affairs surrounding waste management in Bangalore, that only left about another week to conduct field research. Given more time, I likely would have been able to complete Environmental Support Group's original goal of helping to profile one of the wards with my co-intern, Sara Carson. In addition, although this independent field research paper is a case study of Environmental Support Group, it likely would have been insightful to reach out to other non-governmental organizations working in waste management to see their points of view.

For future research on this topic, it might be astute to work with Pourakarmikas and/or rag pickers, and to visit a biomethanization plant, a composting center, or perhaps even a high-ranking official from the Bruhat Bangalore Mahanagara Palike, to learn about their opinions on this topic.

Keeping all of these shortcomings in mind, there are still themes/lessons to be learned from this study. First, “sustainable” waste management is somewhat of a misnomer; if you’re generating waste in the first place, can it truly be sustainable? What’s important moving forward is minimizing the waste generated and the impact that that waste has on the environment. Critically analyzing consumerist and capitalist cultures is necessary in order to manage waste more sustainably, and the solution to waste management isn’t rooted solely in science or engineering; new, more efficient waste treatment facilities will certainly be of great assistance to the issue, but a holistic approach incorporating STE.24 0 2 (, m)1dr

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