Department of Systems and Information Engineering

Engineering, Education, and Infrastructure

Empowering the World's Most Vulnerable

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Dissertation Abstract

The first fundamental canon of the Engineer's Code of Ethics is to 'Hold Paramount the safety, health, and welfare of the public.' This dissertation explores the role of engineering in increasing the 'safety, health, and welfare' of impoverished citizens of the developing world from a systems thinking perspective. It explores the functioning of technology and education in improving the lives of those who lack access to the most basic human physiological needs, particularly access to clean water and adequate sanitation. The approach taken is to move from very broadly considering normative scenarios of human flourishing to proposing increasingly specific approaches to reaching this normative state of being.

Global aid is a ubiquitous phenomenon: organizations across the planet undertake efforts to help alleviate the suffering of the poor, but rarely is the macroscopic outcome of our aid efforts considered. To address this and to provide a motivation for continuing global aid, the first section of this dissertation seeks to develop a normative scenario, or a paradigm, for human development. Drawing on, critiquing, and assimilating a number of modern paradigms proposed by thinkers, organizations, and initiatives—EF Schumacher, Amartya Sen, the Washington Consensus, the Millennium Development Goals, Jeffrey Sachs, William Easterly, and others—I develop a new paradigm for human development and provide a motivation for continuing to conduct aid efforts, tempered with cognizance of the unknown impacts of our actions.

In light of the paradigm developed, and those discussed, the dissertation focuses on finding ways to empower local communities, through education, to organically develop technologically and locally appropriate forms of infrastructure to provide for their essential physiological needs, with a focus on clean water and adequate sanitation technologies. Access to such infrastructure is addressed as a necessary, but not sufficient, step towards attaining human development. Vocational Education and Training (VET) is seeing a resurgence across the developing world as a viable aid/development approach; using the core concept of VET, but adapting it for the needs of the world's poorest to help them locally gain access to water and sanitation, the novel concept of Low-Tech Vocational Education and Training (LTVET) is proposed and developed through a literature review.

As a practical extension of LTVET ideology, the concept of the Community Infrastructure and Empowerment (CIEI) initiative is proposed and explored. The CIEI aims to implement LTVET ideology in impoverished developing communities by empowering marginalized, disenfranchised youth with technical and engineering training suitable for these youth to simultaneously improve their own future employment prospects and to benefit their local community through the infrastructure they will develop. A structure for this program, along with important considerations for it, such as pedagogy, funding, and purpose are presented. Cambodia is explored as an ideal location for the implementation of this program.

A systematic ethical guide to bribery in developing work is provided, as it is assumed that aid workers will likely be required—or at least, requested—to pay a bribe in the course of their work. Drawing on historically accepted ethical theories—utilitarianism, rights ethics, and Kantian ethics—the guide finds that there are times when paying a bribe is the most ethical of a set of unethical choices. Finally, a discussion of the entire dissertation is provided through the lens of systems thinking, drawing on 20 Lexical Components of Systems Thinking and the works of C. West Churchman and Donella Meadows. The CIEI is further modeled and explored from a systems perspective, and a caution against rampant technological development, without regard for intangible human values is given, drawn from Aldous Huxley's *Brave New World*.

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It is no small task to adequately acknowledge and thank all of the people who have made my work on this dissertation possible. I first must thank my parents, Jason and Gina Remer: from basic reading and mathematics to morals and faith, you instilled the foundations of everything I know. Thanks also to my five siblings, for being a community of peers and friends, teaching me the values of both diversity and unity. Thanks to the Breaults, for being my Charlottesville family, and to Jonathan and Julie Baker, for teaching me that "still waters run deep" and helping me plot my future course. Thanks to Laura for helping me sort through complex theories and the emotions that accompany them. Thanks to my late grandfather, Papa Jack, for instilling kindness—to humans and animals alike—in me during my childhood.

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In the interest of not writing an entirely separate dissertation to thank everyone who has positively influenced me, I offer a resounding 'thank you' to all of you unnamed influences. I hope and pray that I, both through this dissertation and the work to follow, can reinvest what you've given to me back into the surrounding world.

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Prologue: A Dissertation of Discovery

Global Development. Foreign Aid. International Charity Organizations. Missions Trips. Volun-tourism. Official Development Assistance. Neo-colonialism. The idea of prosperous people and organizations in developed, wealthy nations helping impoverished people in underdeveloped societies permeates nearly all layers of modern Western civilization—excluding, perhaps, the most entrenched anarchists, extreme libertarians, and dedicated curmudgeons amongst us—and has as many different faces as it does participants. From massive, secular, inter-national organizations such as the United Nations, the World Bank, and the IMF to the little Baptist congregation down the street to the UVA chapter of Engineering Students without Borders, nearly everyone seems interested in what we will call "global development." For some, the interest is religiously motivated. For others, national security abroad provides motivation. Still for others, it serves as good advertising, or as a balm for guilty consciences weighed upon by undeserved Western prosperity—and because helping poor orphans makes for a damn good profile picture on social media. For most of us, it is simply a way to help our fellow human beings in need, in line with Amartya Sen's "deeply held human values." (Sen, 1989). Those of us in the development community probably do not know exactly why we are here, except that we want to help, but even here there is no consensus as to the best way to do this: academic titans William Easterly and Jeffrey Sachs thunder at one another from opposite ends of Manhattan, the former arguing for "free" development and less official aid, the latter claiming that if we all just gave a bit more money, then poverty would be over. (Easterly, 2006) (Sachs, 2005)

My dissertation is another voice in the choir of the development community. I am under no delusion that I have finally found the way to "The End of Poverty," (Sachs, 2005) but I am hopeful that my ideas and studies will be useful and beneficial to some people in some places of

the world. As MIT economists Abhijit Banerjee and Esther Duflo note, there is no "silver bullet" (Banerjee & Duflo, 2011) in the world of global development. No one theory works everywhere, and yet stand-alone anecdotes in support of almost any theory of development can be found. (Banerjee and Duflo, 2011) As they state in *Poor Economics*, "This book will not tell you whether aid is good or bad, but it will say whether particular instances of aid did some good or not." (Banerjee & Duflo, 2011, pp. 4-5) My dissertation aims to present an approach towards development that will do some good for some people in some particular instances.

This dissertation differs significantly from most produced in this department of Systems Engineering, or from most any engineering department for that matter. This is a dissertation of *discovery*, an exploration of ideas that are too broad to neatly sum up in a clean model, set of experiments, or unified theoretical ideology. This is not to say that the ideas proposed here are baseless or detached from reality—they are rigorously drawn from existing theories and techniques in the body of global development literature and practice and are systematically modeled and/or explored—or untestable. They are simply too broad and large to be realistically implemented and tested in a single dissertation. I will propose ideas—most significantly that of Low-Tech Vocational Education and Training (LTVET) as a means towards human empowerment and capacity building—to be implemented and tested in the future. It is entirely possible that some ideas explored here will be failures once applied, or will be shown to be incomplete, missing some piece of important information. That is ok, this is the iterative nature of human growth and development—ideas are conceived, implemented, and refined or rejected based on their impact.

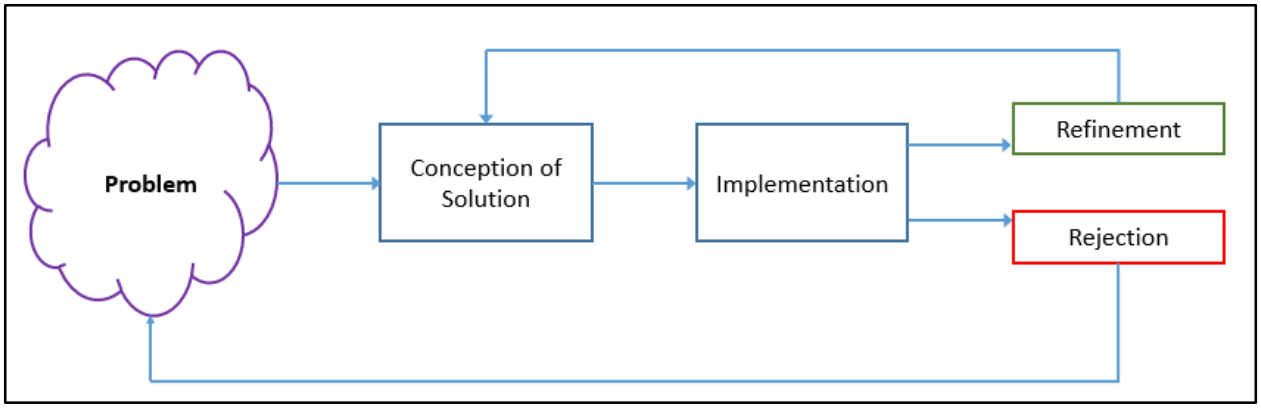

Figure 0.1: Iterative approach to problem solving

The iterative model in Figure 0.1 traces the lifecycle of a potential solution to a problem. A solution is conceived and implemented, and if it is successful it is refined and continuously implemented. Not shown in the diagram is how the problem should "shrink" or change as the solution is applied, improved, and iteratively refined. If the solution is not successful and is thus rejected, then the problem solvers must move on to a new attempted solution. This dissertation will focus on the "Conception of Solution" to some subsets of the problem of poverty in developing communities, with full knowledge that the potential ideas presented here will need further refinement at best and rejection at worst.

The purpose of this prologue is to explicitly define a number of terms, concepts, and themes that occur throughout the rest of this thesis and to introduce the dissertation structure. Some of these terms are broadly used in the body of development literature, some of them are native to this dissertation and are just now being introduced, and most of them fall somewhere in between. The ideas will be contextualized and their interactions explored later, here they are simply defined so that the reader may easily reference the definitions of these concepts throughout the remainder of this dissertation.

i) Human Development

"Human Development" is a catchphrase in the global aid community that seems to be implicitly understood—and striven for—by nearly everyone, and yet an explicit definition of it is surprisingly elusive. The fact that it is a commonly used term today—making human well-being the objective of development rather than simply economic growth—is no small achievement and will be discussed in the first chapter of my dissertation. For now, though, I introduce it as the primary objective of development. The watershed 1990 *Human Development Report* famously stated that:

> People are the real wealth of a nation. The basic objective of development is to create an enabling environment for people to live long, healthy and creative lives. This may appear to be a simple truth. But it is often forgotten in the immediate concern with the accumulation of commodities and financial wealth. (UNDP, 1990)

Over the next couple of decades, this definition was modified and expanded with a central bent towards being a process of enlarging and widening people's choices. (Alkire, 2010) It is not my primary purpose to use this dissertation to explore the moral nuances of the definition of human well-being; stating that the aim of development is to enable people to "live long, healthy and creative lives" is powerful and largely sufficient for most development purposes. However, we in the development community must not ignore the deeper, underlying moral, spiritual—"metaphysical" as EF Schumacher would say—motivations for development and human flourishing. "Why do we care about human flourishing?" Secular humanists would answer this question very differently than religiously-motivated individuals would and may truly may differ over how they define "healthy" and "creative" lives. I do not propose a moral or spiritual paradigm for human development here, but I simply request that all of us involved in the development community reflect deeply on our underlying motivations and goals for human development, realize that these will differ from the motivations of some of our co-practitioners in the same field, and beware that these different motivations may lead to conflicts at certain points.

For purposes of this dissertation, though, I generically define human development as a set of actions aimed towards enabling people to live "long, healthy, and creative lives." This is a simple definition that requires—or allows—each reader to subjectively define "long, healthy, and creative lives" on his or her own, based on the assumption that most of us will come to a reasonably comparable conclusion. Whether or not this is a realistic assumption is a discussion for a different place.

ii) Essential Human Services

While there may be no perfectly clear definition of human development, there can be little debate regarding humanity's fundamental, physiological needs for certain physical services and resources for survival. Garrick Louis and Ali Bouabid propose that there are seven of these fundamental resources, which they term Essential Human Services (EHS). These are 1) breathable air; 2) clean water; 3) food; 4) shelter; 5) sanitation; 6) household energy; and 7) personal security. (Louis & Bouabid, 2013) Regardless of one's paradigm for human existence, all of these elements must be present for human flourishing to occur. Using infrastructure to address a lack of clean water and sanitation services is the primary focus of this dissertation, although it is approached indirectly.

Seven Essential Human Services:

1. Breathable Air
2. Clean Water
3. Food
4. Shelter
5. Sanitation
6. Household Energy
7. Personal Security

iii) Capacity Building

"Capacity building" is another buzzword—not only in the development community but in the business world and beyond—with a number of connotations depending on its context and use. Catholic Relief Services defines capacity building as "an ongoing process through which individuals, groups, organizations and societies enhance their ability to identify and meet developmental challenges." (Catholic Relief Services, 2014) In the context of this dissertation

and its goals, capacity building is defined as "improving the ability of a community—more specifically, the men, women, and children that make up that community—to design, develop, and maintain a technologically appropriate type of infrastructure necessary to [provide for] the essential human services." (Remer & Louis, 2014)

iv) Infrastructure

Merriam-Webster provides three definitions for *infrastructure:* 1) "The underlying foundation or basic framework (as of a system or organization);" 2) "the permanent installations required for military purposes;" and 3) "the system of public works of a county, state or region; *also:* the resources (as personnel, buildings, or equipment) required for an activity." Infrastructure is the foundational system, or set of systems, that allows for a group of humans to function efficiently by providing for no less—and often for more—than their essential needs. In the western world, many of our infrastructure systems are huge and technologically advanced—highways and roads, fiber-optic internet, water and waste-water treatment systems servicing millions of people—but infrastructure need not be so advanced. In an impoverished village in sub-Saharan Africa or South Asia, for example, infrastructure may simply be a couple of wells and latrines. The state, as in functionality and upkeep, of infrastructure is very important, as simply having infrastructure does not guarantee human well-being; for example, if the wells and latrines in the sub-Saharan village are located too close to one another, the drinking water from the well may become contaminated and trigger an epidemic throughout the village. Thus, in this dissertation I am interested in developing *improved infrastructure*, or infrastructure that reliably and appropriately meets the needs of those it serves in such a way as to allow them to engage in other pursuits—e.g. education, arts, self-improvement, economic activity—rather spend their lives pursuing the bare physiological necessities for survival.

v) Appropriate Technology

The concept of "appropriate technology" is rooted in a social push-back, started in the 1970's by EF Schumacher, to over-large, wasteful, and environmentally harmful industrial technologies and practices. Schumacher called for technologies that met the holistic needs of individuals by providing for their needs sustainably and in a way that honors the dignity of both Planet Earth and humanity. While this is a worthy aspiration for all of mankind—and something towards which we should strive as humanity continues to expand—it is not what I mean by "appropriate technology."

Instead, appropriate technology as referenced through the remainder of this dissertation is technology that sufficiently provides for the needs of its users while appropriately matching its users' capacity to utilize and maintain it. For example, let us return to our sub-Saharan or South Asian village, the one whose infrastructure consists of a well and some latrines. Imagine that a foreign aid group enters the village and gives them an advanced reverse-osmosis machine that perfectly purifies the water from the contaminated well and from the nearby river, removing any concerns of contaminants in the untreated water. Let us imagine that the aid group leaves, and the machine they leave behind functions well for a while. Soon, though, the machine breaks down and no local villager knows how to repair it, or spotty electricity service does not allow the machine to operate reliably, making it worthless to the community. This is an example of an *inappropriate* technology. It is a piece of technology that far exceeds the capacity of the community it is meant to serve. Perhaps the aid group would have been more effective by helping the villagers learn how to boil and filter water from the contaminated well using locally available and sustainable materials. An appropriate technology is one that matches a community's capacity for that technology.

vi) Vocational Education and Training (VET) and Technical and Vocational Education and Training (TVET):

As with many of the other terms defined so far, a formal definition of vocational education and training (VET) and technical vocational education and training (TVET) is slippery, varying significantly by context and application. UNESCO's International Centre for Technical and Vocational Education and Training (UNEVOC) states that TVET is "concerned with the acquisition of knowledge and skills for the world of work. (UNEVOC, 2016) Inherent to defining TVET is differentiating it from traditional educational models, such as established universities and colleges. A traditional way of distinguishing the two is to treat academic education as a means of empowering students with analytical skills, critical thinking, and problem solving while TVET is a means towards developing craftsmanship, practical thinking, and practical problem solving. (Education International, 2009) However, as Education International argues, this distinction does not hold up to scrutiny; the plumber with no formal academic education needs some form of analytical skills to do his job, and the highly-accomplished surgeon sitting at the top of the knowledge pyramid needs practical, hands-on abilities to operate on his patients. The literature on the definition of TVET—let alone its application, effectiveness, and value—is fairly dense and will be discussed at length in the second chapter of my dissertation. For purposes of this introduction, it is sufficient to define TVET as any series of educational efforts designed to prepare individuals—typically with low-levels of formal or academic education—for employment in the local or regional workforce. TVET initiatives in the literature are often approached from a top-down perspective, in which programs are agglomerated and evaluated on a macro-scale in terms of their impact on a society. While TVET is the current term used in the development community, it encapsulates a variety of

other programs, including Apprenticeship Training, Technical-Vocational Education, Workforce Education, Career and Technical Education, and Vocational Education and Training. (UNEVOC, 2006)

vii) Low-Tech Vocational Education and Training (LTVET):

Low-tech vocational education and training (LTVET) is a novel concept native to this dissertation. LTVET is a proposed methodology that seeks to provide technologically-appropriate infrastructure to rural and impoverished communities—with low capacity for infrastructure—through training local "unskilled" or "uneducated" individuals using a modified version of the TVET approach. The ultimate goal of LTVET is taking another step towards human development by providing for impoverished peoples' lack of access to the essential human services. The idea is distilled and assimilated from the other concepts previously defined and will be further explored in the body of my dissertation. I use "low-tech" in the name to make clear that advanced, "high-tech" solutions (e.g., the reverse osmosis treatment system I discussed earlier) are not necessarily needed or even appropriate for community development. Despite the global obsession with the knowledge economy and its associated highly-technical skills, sometimes the most appropriate answers to the most pressing human issues are decidedly low-tech, simple, requiring only a small amount of direction, training, and effort. It is this thought that motivates my proposal and exploration of LTVET as a pathway towards human development.

The question arises "what is the goal of this dissertation"? Is it to improve education? To increase access to and reliability of infrastructure in developing communities? Or to simply improve the lives of people with low standards of living? Most simply, the answer is "yes" to all of these questions, and each will be addressed. However, as has already been established, there is

no "silver bullet" to alleviating human suffering or solving global poverty, only step-by-step incremental progress. With this in mind, the primary goal of my work here is to *improve infrastructure, especially water and sanitation systems, in rural developing communities through a practical implementation of Low-Tech Vocational Education and Training as a means towards this end*. Good infrastructure is a public good that provides reliable access to essential human services, without which human flourishing is impossible. Education as discussed in my work here will be as a means to developing better infrastructure—although I realize that other development efforts could rightly take the exact opposite approach and posit that infrastructure is required as a means towards the goal of education. "Solving" the problem of inadequate infrastructure will not solve the problems of poverty or global development, but it will help. Infrastructure is a necessary but not sufficient element in the pursuit of human development, and it is the element on which my work focuses.

"Infrastructure is a necessary but not sufficient element in the pursuit of human development"

The five chapters of my dissertation move from broadly considering—and developing—a paradigm of global development to specifically proposing and exploring ideas for infrastructure development. The first chapter serves as the background and motivation for the rest of the dissertation, exploring in some detail the themes, nuances, and objectives of global development. The second chapter examines workforce development via technical and vocational education and training (TVET) through a literature review. Based on this literature review, I explore the training of disenfranchised populations through an approach I call Low-Tech Vocational Education and Training (LTVET) as a potential pathway to human development and improved quality of life for the world's poorest and most vulnerable populations, allowing the poorest members of vulnerable populations to move from the descriptive scenario of poverty to a more

normative one of relative prosperity. This exploration references Louis and Bouabid's Capacity Factor Analysis for use in determining a community's capacity for infrastructure.

In the third chapter, I propose the Community Infrastructure and Empowerment Initiative (CIEI) as a novel form of LTVET development in the developing world and construct a theoretical model of the program. This model helps to identify key system stakeholders, state variables, and interactions between and among the CIEI system components. I will also discuss a number of NGOs currently operating in the VET/TVET field that provide motivation for and models against which to develop the CIEI. I explore Cambodia as an ideal location in which the CIEI could be initially implemented.

As developing and implementing the CIEI in a real-world context will most likely require interaction with corrupt officials—officials who may be much more likely to cooperate as they should if they are given a payment, a bribe—in the fourth chapter I explore the ethical implications of bribery for aid workers. Drawing on established, historical ethical theories, including various forms of utilitarianism, rights ethics, and Kantian ethics, I provide a framework for guiding aid workers' decisions as to whether paying a bribe is ethical or not. I conclude that, while not ideal, paying a bribe may be a necessary evil to serve the greater good; it may be the least unethical of a set of unethical options.

Chapters 1-3 will be submitted as journal articles with the aim of being published. Chapter 4 has already been published in *Science and Engineering Ethics*. Chapter 5, though, is not meant to be published and is native only to this dissertation. It serves as a sort of systems-thinking defense of the preceding four chapters, using Peter Whitehead, William Scherer, and Michael Smith's 20 Lexical Components of Systems Thinking to demonstrate how, despite its non-technical nature, this dissertation is in fact a work of systems engineering. I argue there that engineers should

serve not only as technologists, but as mediators between technology and society. The first canon of the engineer's code of ethics is to 'Hold Paramount the safety, health, and welfare of the public' (National Society of Professional Engineers, 2016): fulfilling this mandate requires that engineers understand the holistic human needs of the public. In this final chapter, I also further evaluate the CIEI concept through a stock-and-flow systems diagram, identifying interactions and objectives of the initiative. Finally, I provide a final caution against the rampant pursuit of human and technological development without careful consideration of where we are headed, using Aldous Huxley's *Brave New World* as a warning of where irresponsible development could lead.

This dissertation provides ideas and theories to add to the global discussion on how to alleviate the suffering of our impoverished fellow humans without providing specific, measurable objectives. It is my sincere hope that the ideas developed here serve to inform our discussions on development and that, given time, funding, and effort the theoretical models I have developed may be properly implemented and brought to life to the benefit of our brothers and sisters around the globe.

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Department of Systems and Information Engineering

1. An Overview of Global Development

Paradigms, Confusion, and Progress

J. Scott Remer

Abstract

This paper provides an intellectual history of global development during the late 20th and early 21st centuries. It presents and examines three high-level paradigms of development theory, looking at the Washington Consensus and its use of GDP as a primary measure of development; EF Schumacher's more meta-physical response to the Consensus's materialistic bent; and Amartya Sen's more practical-but-holistic arguments for development as an expansion of human freedoms and capabilities. Next, the U.N. Millennium Development Goals are examined as one of the largest concerted efforts of development, a "practical paradigm" of it. The paper then asks and answers the question of whether or not aid, in a global development context, is worth pursuing into the future, framing the argument between Jeffrey Sach's support for global aid and William Easterly's opposition to it; Abhijit Banerjee and Esther Duflo's navigation of Easterly and Sach's disagreement, using Banerjee and Duflo's own research, provides a motivation for continuing to pursue aid in particular circumstances to accomplish particular good, rather than sort out whether aid is inherently 'good' or 'bad.' Finally, the paper presents a new paradigm for development, based on the previous concepts and discussions, to further enhance global development discussions and to amend some of the shortcomings in the other approaches.

Keywords: global development, development paradigm, motivation for aid

1 Introduction

In my first semester as a PhD student, my adviser boldly declared in a department-wide colloquium that "there are no experts in the study and alleviation of poverty." "Wait, wait, wait," I said to myself, "what are you talking about?" and proceeded to list in my mind all of the experts in poverty that I knew of: myself (having lived in Kenya for a summer working on water issues qualified me for this position), my adviser, some of those NGOs I had heard about, and—on a much larger scale—the United Nations, the IMF, the World Bank, USAID. Surely these organizations contained myriad so-called "experts" on poverty and how to solve it?

Years, books, studies, and many journeys to the developing world later, I have begun to understand what my adviser meant. Poverty is persistent. Aid efforts abound, and some of them seem to work well, as can be seen in the flashy photos and captions on NGO and aid organizations' websites as studies document increased access to food, infrastructure, and freedom for impoverished people the world over. The UN Millennium Development Goals, while not completely accomplished by their expiration date of 2015, have improved the lives of millions across the globe. But there are still problems—children continue to starve, malaria and HIV/AIDS still claim lives in Africa. Women are still oppressed and relegated to subservient roles worldwide. Hope for a better life seems distant, even altogether out of reach, for many.

But—without seeking to become existential for existentiality's sake—what in fact constitutes a better life for the poor, anyway, and how do we help them achieve it? How do we measure so-called progress and—even less clear—how do we bring it about? Should we devote a significant portion of global GDP to help break the global "poverty trap," (Sachs, 2005), or should we simply withdraw aid altogether on the conviction that, by providing "aid," we are in fact instituting a neo-colonialist empire? (Easterly, 2013) How does progress in one area affect another?

1.1 Goals and Objectives

These are not simple questions, and much wiser scholars than I have wrestled with them. Yet too often aid projects—ranging from little church groups following the pastor to Mexico to help feed the starving orphans to multi-million-dollar loan forgiveness programs for African governments—proceed with little cognizance of what their final goal is and what the unforeseen consequences of their actions may be. The unintended consequences of aid projects have led to the publication of books with titles like *Dead Aid* (Moyo, 2009) (Gore, 2000), claiming that aid is a (usually unintentional) way of oppressing developing nations, Africa in particular. This paper, then, functions to evaluate on a macroscopic level the paradigms, theories, and motivations of and for global development.

This paper is not an analysis of specific practices, policies, institutions, or financial instruments that feature heavily in the ground-level implementation of international development, but rather a paradigmatic consideration of the aims and objectives of it. Initially it will review high-level, non-applied theories—i.e., what are the aims and purposes of global development—drawn from the existing body of literature. The neoliberal paradigm as summarized by the Washington Consensus, EF Schumacher's perspective in *Small is Beautiful*, and Amartya Sen's holistic conception of human freedom and capabilities are examined in this section.

The next section reviews more tangible theories that currently shape the discussion of what the applied goals of the development community should be. First, the United Nation's Millennium Development Goals are discussed and briefly critiqued generally; Jeffrey Sachs and William Easterly's opposing viewpoints are compared and contrasted; and MIT economists

Abhijit Banerjee and Esther Duflo's perspective is then explored as a medium between the Sachs/Easterly schism.

In the final section, a synthesized new paradigm of global development, based on the literature reviewed in the previous sections, is offered as a normative scenario for global development, as well as a motivation and justification for continuing to pursue aid and global development despite some of its inherent complexities. While the new paradigm presented here will not replace any existing end-goals for human development, it is intended to add a cohesive objective into the development community and to assist in facilitating further discussion as we seek to improve the lives of millions across the globe.

1.2 An Assumption on Definitions and Motivations

It is worth making two clarifications before proceeding. The first is to establish a working *definition* of global development, as compared to a *paradigm* of it, so that the term "global development" is used cohesively through the remainder of this paper; the second is to assume a baseline motivation for those practitioners, thinkers, and decision-makers comprising the global development community.

The overarching purpose of this paper is to explore varying paradigms of global development and to elicit a new one, where a paradigm is a "constellation of beliefs, values, techniques and group commitments shared by members of a given community, founded in particular on a set of shared axioms, models, and exemplars." ((Gore, 2000); Footnote 1 on (Kuhn, 1970)) Inasmuch as paradigms and definitions both seek to encapsulate sets of ideas and objectives, they are related, but they differ in that a definition simply seeks to cohesively *name* the concept(s) under consideration, whereas a paradigm seeks to expatiate, encapsulate, and contextualize it. Roughly speaking, a paradigm of global development consists of this entire

paper—or really an entire body of literature—whereas a definition of it can simply be contained in the next paragraph.

For our purposes, we will assume that "global development" and "human development" can be used interchangeably in the remainder of this article[1], as both aim to improve the lives of presumably all humans in the world. The first UN Human Development Report famously stated that:

> People are the real wealth of a nation. The basic objective of development is to create an enabling environment for people to live long, healthy and creative lives. This may appear to be a simple truth. But it is often forgotten in the immediate concern with the accumulation of commodities and financial wealth. (UNDP, 1990)

Drawing from this statement, human and global development are here simply defined as a set of actions aimed towards enabling people to live "long, healthy, and creative lives." Establishing a paradigm out of this definition means we must consider what in fact "long, healthy, and creative lives" are and how they are brought about. As shall be seen, there is much debate surrounding these elusive paradigms, with some development actors calling for direct intervention in the lives of the poor while others argue that wealthy nations should effectively withdraw all forms of aid altogether and let people and communities develop on their own[2]. This leads to a need for an assumption on the motivations of those involved in global development.

For purposes of this paper, it is assumed that the development community —referring here to developers such as politicians, academics, NGO leaders, business leaders, social workers,

[1] "Global" and "human" development are in fact two different things; the latter deals with the individual well-being of specific humans, whereas the former focuses on the agglomeration of groups of humans geographically, and otherwise, spread across the globe. This paper assumes that both share the end goal of aggregated human prosperity and can thus be used interchangeably, but this may not be a realistic assumption.

[2] It should be noted that those calling for a cessation of aid are not inherently cold-hearted or indifferent to the suffering of other humans. They simply believe that the most effective means to helping other people is to allow them to sort their issues out organically, without external aid.

and aid workers, not the beneficiaries of development—are so involved because they are motivated to improve the lives of their fellow woman or man and believe that their own lives will benefit as a result of this improvement. (This is in no way to state that the beneficiaries of development are not interested in the good of their fellow human, just that this group is not being addressed right now.) Whether the developers' desires to help humanity are religiously motivated, spring out of Amartya Sen's conception of "deeply held human values" (Sen, 1989), or come from some other source is here considered irrelevant. It is assumed that most people on the planning side of development are, in a word, benevolent. Of course there are some bad apples, corrupt individuals who want to take advantage of the system or exploit resources and people through some neo-colonialist mindset, but these individuals are left out of this discussion. Thus, even in the midst of vehement disagreement on how global development should proceed, let us remember our common goal and desire to help those less fortunate than ourselves.

2 High-Level Theories of Development

This section presents and explores large-scale ideas of what human development paradigmatically is and/or how we should measure it. Individual problems related to human suffering, such as hunger, disease, oppression, and more, are not explicitly mentioned or measured, they simply factor into the overarching human experience addressed in this paper. Here we are concerned with defining the macroscopic metrics of societal "good" as experienced by humans around the globe. The Neoliberal Paradigm, also known as the Washington Consensus, encapsulates progress in global development through measuring market growth and increase in Gross Domestic Product (GDP), an easily-captured, simple metric. The simplicity and inherent bias towards materialism in the Neoliberal approach has drawn significant criticism

over the years though: money cannot really make us happy it argues, and growth for growth's own sake detriments humanity and Planet Earth. So what to do instead?

EF Schumacher, in his seminal *Small is Beautiful* (Schumacher, 1973), argues that humans are meant for more than material products, that modern consumerism has replaced the metaphysical and communal needs of human society. His arguments range from the practical to the metaphysical, verging on the religious. Of particular concern to him is usage of appropriate technologies that supplement humanity's basic need for meaningful work, rather than replace it altogether or turn humankind into a machine only so that we can further work on our machines.

Amartya Sen, one of the most influential actors in modern development thought, keeps his discussion slightly more practical than does Schumacher. Instead of delving into metaphysical and spiritual values in addition to practical concerns, Sen argues that the purpose of development should be the increase of human freedom and capabilities.

2.1 The Washington Consensus

The Washington Consensus is a set of ideas—rooted in Reagan-inspired 1980's Western economic theories—propagated by the US government and international financial institutions. According to Charles Gore, the Washington Consensus consists of three broad objectives for developing nations. Developing states should:

a) pursue macroeconomic stability by controlling inflation and reducing fiscal deficits;
b) open their economies to the rest of the world through trade and capital account liberalization;
c) liberalize domestic product and factor markets through privatization and deregulation. (Gore, 2000)

The Washington Consensus, a title coined by John Williamson in 1990, (Center for International Development at Harvard University, 2003) comprised a set of specific policies to achieve the three general goals just listed. According the World Health Organization (WHO), the framework for these goals consisted of 11 components: 1) Fiscal discipline; 2) Public expenditure priorities; 3) Tax reform; 4) Financial liberalization; 5) Exchange rates; 6) Trade liberalization; 7) Increasing foreign direct investment; 8) Privatization; 9) Deregulation; 10) Secure intellectual property rights; 11) Reduced role for the state. (World Health Organization, 2016)

As previously mentioned, this paper does not critique or analyze the individual or technical components of the Washington Consensus or any other paradigm. It does, however, make the point that the consensus was not simply a temporary set of technical ideas and methodologies proposed for developing countries, but instead that it was, and to some degree still is, is a paradigm—perhaps the most dominant of the late 20th century— for global development. The Washington Consensus embodies and defines the neoliberal approach to development (*cf.* (Center for International Development at Harvard University, 2003)): free-market economics is king, not just for developed and mature economies but for *all* economies. If everyone—nations, corporations, and individuals—can simply have uninhibited access to the marketplace, things will take care of themselves. Poverty and starvation will be eradicated because spontaneous solutions will arise through trade, and the world will be a better place for all.

Gore argues that the Washington Consensus was a paradigmatic shift in thinking about global development in two general ways. First, it shifted the development mindset, both in terms of explanatory and normative frameworks, from one of post-WWII nationalism to one of partial globalization, in which national economic policies are determined on a national level but

primarily with international market participation in mind. More significantly, it shifted the metrics of a nation's development from historical ones to performance-based ones. Previously, claims Gore, developmental progress had been understood through seeking to understand

> …rhythms, patterns, and laws of development. This understanding was based on historical analysis of long-term sequences of economic and social change, which had occurred in the past in already-industrialized countries and were expected to re-occur, particularly if the right policy interventions were made in "less-developed" countries. (Gore, 2000, p. 794)

The Washington Consensus shifted the focus from historical patterns—flawed as they may have been—to simple ahistorical performance metrics. The primary metric solidified by the Consensus was recent or current Gross Domestic Product (GDP) growth rate, in addition to macroeconomic stability as indicated by inflation rates and fiscal and external payments. (Gore, 2000) The obsession with increase in GDP, cast as "growth" or "progress," without significant regard for distribution of wealth, human life, personal freedoms, or the vitality of the environment, has led to a deep-seated mistrust, even antagonism, towards the Washington Consensus ideologies. The charge is that the Consensus leads to materialism and reckless consumption of precious natural resources. The human faces and experiences not captured in the simple metric of GDP growth are, in fact, central to human development, are the objectives of it, not income in and of itself. The neoliberal approach benefits those who are already strong enough to compete on the open market, while those who are weak have little choice but to play the game as set by the strong or be trounced by them.

This is not to say that the free marketplace needs to be done away with as harmful to nations or as evil in itself; a nation gaining economic maturity—empowered by enhancing the nation's technological and institutional capacity—with the clout to compete on the international marketplace should be one—of many—goals for its development. However, inundating a

developing economy in the competitive marketplace right from the get-go—regardless of the maturity of its technological and institutional capacity—will hamper holistic human development in the nation.

The problems with the ideas embodied by the neoliberal ideology have inspired other thinkers to more holistically examine the purpose of international human development and what its aims should be. I examine paradigms developed by E.F. Schumacher and Amartya Sen next as complementary—if different—responses to the Washington Consensus paradigm.

2.2 E.F. Schumacher and the Holistic Paradigm

Recognizing the shortcomings of a GDP-centric, ahistorical approach to development, a body of literature sprang up in the late 20th century calling for a more holistic approach. The central theme of this literature was that, instead of focusing on income or economic "growth" as defined by an increase in GDP, development should consider the well-being of individual humans as valued by less tangible metrics, such as quality of life, freedom, and health, as well as ecological and environmental well-being. E.F. Schumacher and Amartya Sen are two of the most prominent voices in this movement. Both look beyond GDP to what we may call a more holistic human experience, but they differ on their scopes and the applicability of their ideals. Schumacher looks not only to physical and emotional well-being, but appeals to metaphysical and religious values common to the human experience, crying for harmony between humans and our environment from Buddhist and Christian perspectives. Sen, as we shall see in the next section, also takes a holistic view to human empowerment, but his scope is much more concerned with non-spiritual qualities and instead focuses on impacting the day-to-day opportunities available to humans.

Ernst Friedrich Schumacher, chief economist for Britain's National Coal Board and student of John Meynard Keynes, in his 1973 classic *Small is Beautiful* called for a rethinking of growth and development. He argues for moving away from bottom-line profits and corporate efficiency to lifestyles that are more in tune with nature, small communities, and a person's innate desires to do meaningful work with his or her hands, even at the cost of corporate efficiency. Schumacher's argument was both geared towards addressing international development work and recalling all of his readers' attention to some of the ancient wisdom contained within the human psyche and tradition. He argued profusely for the need for "intermediate technology," technology that is "conducive to decentralization, compatible with the laws of ecology, gentle in its use of scarce resources, and designed to serve the human person instead of making him the servant of machines." (Schumacher, 1973, p. 163)

There are many valuable lessons to be learned in *Small is Beautiful*, and every development thinker would do well to familiarize themselves with it. In a sense, it reminds us of what it means to be human, to be part of something bigger and more beautiful than ourselves, going beyond our modern science, that we as individual humans feel more complete when we are closely connected to a community with whom we feel at home. Schumacher calls for a dose of humility in approaching issues pertaining to "progress." His scope varies: at times, he speaks to the need for humans to grow in our metaphysical values when speaking about education: "We are suffering from a metaphysical disease, and the cure must therefore be metaphysical. Education which fails to clarify our central convictions is mere training or indulgence. For it is our central convictions that are in disorder…" (Schumacher, 1973, p. 107). In another section, he explicitly lays out a plan for a pseudo-socialist society in which large companies are half-owned by members of the company and half-owned by the surrounding community. He steps on

the toes of both traditional left- and right-wing thinkers, calling for small, decentralized communities that focus not on productivity but human happiness and peace.

Schumacher presents a paradigm for human development in which people live fulfilling, happy lives in touch with their (small) communities in symbiosis with nature, and he makes compelling arguments for how this may look in a variety of situations. He does not, though, present firm metrics that may be useful in measuring human development across the globe, firm ideals to which we can strive and measure our progress. While this may in fact be his intention, it leaves those involved in the development community wondering what we should do—short of instigating an upheaval of modern society—except for incorporating his ideas of local-ness, permanence, and spirituality in our efforts. While reading *Small is Beautiful*, it is necessary to keep a clear mind, else one might find themselves over-utopianizing small communities. While the "small life" might sound appealing and indeed it may be, one need only to remember that small groups of people throughout history have been prone to violence just as large groups have; tribal warfare and the weapons developed therein is just one example of this.

Thus, Schumacher's paradigm is not a practical or applied one. It is the polar opposite of the neoliberal one and provides a valuable mindset from which to approach the problem of global development, a motivation for the types of lives we and our fellow humans should live in the context of each other and our surrounding physical and metaphysical world, but it does not do much at all in helping us get there. In the next segment, I examine Amartya Sen's approach to global development, as it is still in opposition to the neoliberal one, but slightly more applicable in the real world than is Schumacher's.

2.3 Amartya Sen and Human Capabilities

Amartya Sen has become a figurehead in modern development thinking. His ideas—echoing strongly of Immanuel Kant's imperative to "So act as to treat humanity, whether in thine own person or in that of any other, in every case as an end withal, never as a means only" (Kant, 1909)—have formed the paradigmatic backdrop for a great portion of modern development thinkers. In the 1980's, Amartya Sen argued that international development should be focused on empowering human abilities, not just the systems and products of human activities, through enlarging a person's "functionings and capabilities to function, the range of things a person could do and be in her life." (Sen, 1989). Sen lays out a philosophy in which humans have a certain set of "functionings," individual actions available—or unavailable—to them. For example, Sen lists escaping mortality, or being adequately nourished, or undertaking usual movements as examples of basic functionings. The sum of a person's functionings then comprise that person's "capability," which "reflects the various combinations of functionings (doings and beings) he or she can achieve." (Sen, 1989, p. 44) Capability "reflects a person's freedom to choose between different ways of living." (Sen, 1989, p. 44) Sen's core argument is that development should increase human *capabilities*, which is synonymous with human freedom, which, in turn, should be the end goal of development and, indeed, human well-being. The titles of his works *Development as Freedom* (1999) and *Development as Capability Expansion* (1989) reflect this view. Sen argues that "Human freedom should be viewed as both the primary *end* and the principle *means* of development." (Tungodden, 2001, p. 1)

Sen contrasts this focus on human functionings and capabilities with the more traditional development economic focus on commodities, pricings, and incomes. He never accuses the science of economics of, intrinsically, ignoring holistic human needs in favor of solely increasing

income—an accusation that Schumacher effectively levels (Schumacher, 1973)—without regard for distribution of wealth. In fact, Sen says that "economists as a group cannot be accused of neglecting inequality as a subject." ((Sen, 1999); p vii) But he does argue for a re-focusing of the development community away from simply increasing GDP and market access to considering the individual freedoms afforded to members of a society.

Sen's arguments formed the backbone of the UNDP Human Development Reports (HDR). (Fukuda-Parr, 2003) The purpose of these reports was "to shift the focus of development economics from national income accounting to people centered policies." (Haq, 1995) These reports, along with the work of Sen and many others, led to the development of a variety of rich metrics for quantifying a nation's level of development, including the Human Development Index (HDI) and also led to what is known as the Human Development Approach. This defines development as being "about removing the obstacles to what a person can do in life, obstacles such as illiteracy, ill health, lack of access to resources, or lack of civil and political freedoms." (Fukuda-Parr, 2003)

The strength of Sen's work is that it provides a robust ideology for what human development actually is, a definition that can evolve with humanity. Unlike the Washington Consensus, it allows for a holistic take on human well-being. It provides us with a well-rounded approach to assessing the quality of human life, at least in a qualitative sense. A weakness of Sen's approach, though, is that it provides no hard, tangible goals for development work but instead stays fairly broad. Sen does stress the practical needs for people to be "well-nourished and well-sheltered, [and have] the capability of escaping avoidable morbidity and premature mortality and so forth." (Sen, 1989, p. 46)

Other authors, such as Sakiko Fukuda-Parr, have built on Sen's framework, expanding his arguments to include issues such as gender and caste parity. She explains how the United Nations Development Program's (UNDP) Human Development Reports were formed through the efforts of Amartya Sen and Mahbub al Haq, and how the Human Development Index (HDI) serves as a more holistic, single-number metric for human development. She then explains how the HDI has been expanded to capture such issues as gender parity. Fukuda-Parr, in addition to showing how and why gender equality is necessary to increase human capability, also distills Sen's work, along with the work of many others, into what she calls a "New York consensus." This consensus consists of five goals that are, while still fairly high-level and difficult to measure, much more concrete than anything provided by Sen. These goals are:

- Priority to "social development" with the goals of expanding education and health opportunities.
- Economic growth that generates resources for human development in its many dimensions.
- Political and social reforms for democratic governance that secures human rights so that people can live in freedom and dignity, with greater collective agency, participation, and autonomy.
- Equity in the above three elements with a concern for all individuals with special attention to the downtrodden and the poor whose interests are often neglected in public policy, as well as the removal of discrimination against women.
- Policy and institutional reforms at the global level that create an economic environment more conducive for poor countries to access global markets, technology, and information. (Fukuda-Parr, 2003).

The New York consensus thus distills Sen's, Fukuda-Parr's, and many others' ideas into a sort of paradigm for human development, but this paradigm is still high-level and leaves us lacking any practical definition of how to actually implement it. The next section explores some more-applied ideas related to aid and global development, many of which draw their inspiration or context in part, at least, from ideas contained in the paradigms just explored.

In closing this section, it is worth noting that the paradigms discussed here are not representative of the entire body of literature on the objectives of global development, and the summaries presented of the views of each paradigm are simplified so as to be easily accessible to all readers. This discussion has simply presented the "tip of the iceberg" for three major ideas in the development world, and the reader is encouraged to pursue further study in each presented paradigm and beyond into other ideologies.

3 Applied Theories of Development

The previous section sketched three high-level paradigms for global development without direct concern for how we, the development community, should help humanity achieve the goals there set forth. This section explores some relatively more application-focused theories, programs, or initiatives related to global development. The issue being explored here is how we, rich Western members of the development community, should—or should not, as the case may be—go about trying to achieve global development, as well as to provide an overview of some of the initiatives already under way. An additional objective of this section is to provide a motivation for continued aid efforts that takes into account the potential harm that aid can cause.

Initially, the U.N.'s Millennium Development Goals—perhaps the largest institutionalized global aid initiative—are discussed and slightly critiqued to provide an example of an

implemented—not just theoretical—instance of aid in pursuit of global development. I then point out three of the most outstanding shortcomings in the structure of the MDG paradigm. Next, I compare and contrast Jeffrey Sachs and William Easterly's opposing views on how aid should be conducted. Then, using Abhijit Banerjee and Esther Duflo's work in their book *Poor Economics*, a course for aid is charted between Sach's and Easterly's opposing views.

Excluded from this section is any direct conversation related to the myriad non-profit organizations operating in the development field; NGOs; government entities, e.g., USAID, Australian Aid, or Great Britain's Department for International Development; regional organizations or conglomerations of states, e.g., the Association of Southeast Asian Nations (ASEAN); and university-based or religious-organization aid efforts. Foreign aid, how to do it, who is doing it, whether it works, and whether we should keep doing it is titanic in scope and cannot be fully addressed in a single paper. The purpose of this section is to simply present and ponder some of the major voices in the development choir and provide context for discussion on future, effective aid efforts.

3.1 The Millennium Development Goals

In 2000, the United Nations instituted the Millennium Development Goals (MDGs). These eight goals were the "world's biggest promise—a global agreement to reduce poverty and human deprivation at historically unprecedented rates through collaborative action." (Hulme, 2009) The eight goals, to be accomplished by 2015, were to 1) Eradicate extreme poverty and hunger; 2) Achieve universal primary education; 3) Promote gender equality and empower women; 4) Reduce child mortality; 5) Improve maternal health; 6) Combat HIV/AIDS, malaria, and other diseases; 7) Ensure environmental sustainability; and 8) Develop a global partnership for development. (United Nations, 2013) These eight goals form a sort of practical paradigm, one

with measurable goals that can be evaluated and analyzed, that draws on elements of the theoretical ones presented and discussed in the previous section. Each is briefly evaluated and critiqued.

Some have hailed the MDGs as the means to ending global poverty: "The end of extreme poverty is at hand…the Millennium Development Goals are bold but achievable [t]hey represent a crucial midstation to ending extreme poverty by the year 2025." (Sachs, 2005) Others have been more skeptical: "The setting of utopian goals means aid workers will focus efforts on infeasible tasks, instead of feasible tasks that will do some good." (Easterly, 2006). Still others have outright decried them: "I do not believe in the MDGs. I think of them as a Major Distracting Gimmick." (Antrobus, 2003) So, were the MDG's the hope for humanity, or worthless fluff touted by politicians?

The answer, we shall see, is not completely one or the other. The MDGs provide concrete, measurable goals and metrics applied to the ever-so-complex system of humanity and humanity's environment, and anytime a complicated system is prodded or manipulated to meet a set of "simple" goals, there are bound to be unforeseen happenings. Much good has been accomplished through the MDGs. In the UN's 2013 Millennium Development Goals Report, Ban Ki-Moon, Secretary-General of the United Nations, states that accomplishments of the MDGs have included "halving the number of people living in extreme poverty and the proportion of people without sustainable access to improved sources of drinking water," among other accomplishments. It is hard to argue against this being a good thing, and the MDGs have doubtlessly done much good for many people and will continue to do so.

What follows is a high-level, cursory analysis of the eight MDGs. Whether or not the goals were accomplished, or the degree to which they were accomplished, is not here evaluated.

Sub-goals are not exhaustively considered. If the eight MDGs represent a broad, applied development paradigm, this is a generalized evaluation and critique of that paradigm. At the end of this section, I provide a list of what I consider to be three of the greatest weaknesses in the MDGs.

3.1.1 Goal 1: Eradicate Extreme Poverty and Hunger

The specifics of this goal were to halve the percentage of people whose income was less than $1.25 per day between 1990 and 2015, a goal that was accomplished in 2010; to achieve decent work and productive, full employment for all, including young people and women; and to halve the proportion of people who suffer from hunger between 1990 and 2015. (United Nations, 2013)

But poverty and hunger's impact on the poor is not so easy to define, let alone change. In *Poor Economics*, Abhijit V. Banerjee and Esther Duflo explore how impoverished people often do in fact have enough money, even when they earn below 99 cents per day, to eat enough food to be decently nourished. This nourishment would then allow them to work harder, more demanding jobs and thus earn more money and break the cycle of poverty.

The problem is, this nourishment would come in the form of plain, staple foods, and the poor often desire food that tastes good, not unlike you and I do. "When you are unemployed, you don't *want* to eat dull wholesome food. You want to eat something a little *tasty*." (Banerjee & Duflo, 2011, p. 35) On top of this, instead of spending their income on nourishing foods as an investment to be able to earn more money or just to be full, they often spend significant amounts on festivals, holidays, or other events. "The poor often resist the wonderful plans we think up for them because they do not share our faith that those plans work, or work as well as we

claim…Another explanation for their eating habits is that other things are more important in the lives of the poor than food." (Banerjee & Duflo, 2011, p. 35)

Thus, it is well and good to speak of ending poverty and giving everyone jobs, but doing so involves more than just creating opportunities and giving out food—it involves learning how people think, meeting them where they are, and training them, or it may simply involve realizing that some people do not want to change their lifestyles.

3.1.2 Goal 2: Achieve Universal Primary Education

The primary objective of this goal is to "Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling." (United Nations, 2013) Nelson Mandella said that "Education is the most powerful weapon which you can use to change the world," and this MDG reflects Mandella's beliefs. Sadly, though, this goal suffers from being well-intentioned but not specific enough. The goal requires that all children receive a primary education, but it does not specify in any way the quality of that education. Unfortunately, in many cases, this translates to children sitting in their schoolhouses doing almost nothing while their teachers drink tea, talk to other teachers, and do not teach. (Banerjee & Duflo, 2011) In fact, some studies show that children who are not in school learn basic math skills better than their enrolled counterparts: "…all over the Third World, little boys and girls who help their parents in their family stall or store do much more complicated calculations [than children in school] all the time, without the help of pen and paper." (Banerjee & Duflo, 2011, p. 75) While this MDG is well-intentioned, then, it may have the unfortunate consequence of actually crippling some of the very children it is trying to help.

3.1.3 Goal 3: Promote Gender Equality and Empower Women

This goal, which aims to eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015, (United Nations, 2013) is directly in line with Fukuda-Parr's desires and serves to improve the quality of life not just for women but for everyone who interacts with them. There is very little to critique in this approach.

However, it is worth pausing to make sure that, as we seek to empower women and girls, we do not forget that half of the population is made up of males as well, and little boys today become the men of tomorrow. Men in many developing (and industrialized!) countries are often cast as being lazy, selfish, drunk, and oppressive. Sadly, this is often true, and many men have this reputation because they have earned it. However, instead of accepting this as fact and deciding to focus on women instead, I believe that it is necessary to train what we may call *good* men, men who embody the principles of self-sacrifice and leadership. Training responsible and caring men will do nothing to inhibit the development of women and instead will further empower them.

It is also worth noting the context of gender roles in developing nations. Throughout most of human history, males have had the jobs of hunting, fighting, protecting, and doing otherwise the most strength-intensive jobs while women have generally been focused on the home. I do not here claim a hard and fast rule—women such as Joan of Arc and Artemisia, the Greek naval commander who served in Xerxes' army at the Battle of Salamis broke this stereotype—but in general, for highly physiological reasons, men were more involved in the activities that publically shaped society. However, in the West over the past several centuries, technology has highly mitigated the need for physical strength to accomplish physical tasks. To

protect one's land and kill one's enemy, a man or woman need only need pull a trigger—or fly a drone—now instead of swing an axe or a sword. To move a heavy load of bricks, one need only know how to operate a forklift instead of loading them into a wheelbarrow by hand.

Technology is then, in a sense, a necessary condition for the modern empowerment of women[3]. In the west, our gender stereotypes have changed and still are changing, albeit more slowly than may be right or necessary, with our technology. In developing nations, though, technological infrastructure is often not at the same level of development as it is here, and the social practices may not have had time to "catch up" with the new gender roles available to them through technology. This is worthwhile for development workers to ponder as we seek to empower women in developing societies.

3.1.4 Goal 4: Reduce Child Mortality

The explicit statement of this goal is to "reduce by two thirds, between 1990 and 2015, the under-five mortality rate." (United Nations, 2013) There is very little to critique in this goal as a piece of a human development paradigm. Reducing child mortality is an admirable goal that cannot be directly changed, but instead can only be indirectly shaped through initiatives in water, sanitation, medical, and educational infrastructure, so the impact of initiatives in these areas should be measured on this one.

3.1.5 Goal 5: Improve Maternal Health

As with reducing child mortality, there is very little to say against improving maternal health as a piece of a development paradigm, and it plays directly into Goal 3, to promote gender

[3] A lack of technological capability does not excuse the repression of women or any other people group, but it shapes the way a society thinks of such issues. I do not propose to have any depth of understanding on the interplay between technology and oppressive cultural practices and how to avoid such practices in the absence of sufficient technology, I simply aim to open a discussion on the topic.

equality. Improving maternal health requires not just medical treatments, handing out birth control, and giving away vitamins but also involves working closely with cultures and individuals to change several practices associated with pregnancy and childbirth.

3.1.6 Goal 6: Combat HIV/AIDS, Malaria, and Other Diseases

Controlling HIV/AIDS is no simple matter because the disease is inextricably linked to people's sexual practices, and sexual practices are linked, somehow or other, to almost every aspect of human life. Condoms are one effective way to combat the spread of the disease, but not everyone uses them or believes in their necessity. Promiscuous men are one of the worst propagators of the disease; when they have contracted it, they continue to have relations with their wife (or wives in some cultures) and partners, spreading the disease to them and to their children[4]. This works directly against empowering these women and their children, but there is not much they can do about it as individuals. This is one reason why I believe that it is necessary, as mentioned in the section on empowering women, to empower men to rise above their carnal instincts and instead become leaders in sacrificing their own desires.

Combating other diseases, such as malaria, is vitally important to the bettering of the global human condition and thus is an essential element of the global development paradigm. However, finding an appropriate methodology for combating it is far from simple. Historical methods that were used in the now-developed Western world—e.g., spraying DDT to eliminate disease-carrying insects—are no longer seen as favorable due to their impacts on the environment and human health. Initiatives to distribute bed nets in Sub-Saharan Africa have proven effective, but how should such bed nets be distributed? Perhaps they are too expensive

[4] There is a large body of literature exploring the role of sexual ethics in the spread of AIDS in Sub-Saharan Africa, some of which support my statement here (Gausset, 2001) and some of which do not (Sovran, 2013). The reader is encouraged to explore this issue further.

for the poor to purchase at market prices, so should they be subsidized or given away? If they are given away, though, will that undercut the local market, putting potential bed-net-sellers out of business, so that when the free nets are all gone there will be no way to purchase the nets? Will the poor even use bed nets if they are made available to them in numbers sufficient to combat the disease? Studies have been conducted to answer many of these questions (Banerjee & Duflo, 2011), finding that if given subsidized nets, impoverished individuals will be likely to purchase them again at full price.

3.1.7 Goal 7: Ensure Environmental Sustainability

This goal is extremely broad and attempts to capture the objectives of sustainable development, curtailing biodiversity loss, providing safe drinking water and basic sanitation to the poor, and improving the lives of slum dwellers all in one go. (UN, 2013) Each of these sub-goals is highly inter-related with all the other MDG's. For example, creating jobs in sustainable development may provide work to people and help eliminate poverty, making the MDG reinforce the first goal. However, many jobs have been and will be created in non-sustainable fields that destroy bio-diversity, accomplishing the first goal but working against this one.

It is interesting to note drinking water and basic sanitation are included only as sub-pieces of this goal, when lack of access to sanitation is in fact one of the largest contributing factors to infant mortality in developing nations. (Bartram & Cairncross, 2010) Sanitation and basic infrastructure access should feature more heavily in a development paradigm.

3.1.8 Goal 8: Develop a Global Partnership for Development

Like the seventh MDG, this is a very broad goal with many objectives, ranging from addressing the needs of the poorest nations to partnering with private industries to achieve other

development goals. This MDG cuts to the issue of what the responsibility of developed nations—and individuals and companies within these nations—is to the developing world, and there is no firm consensus on what that responsibility should be. Some believe that industrialized nations should be involved, through public programs, in the lives of those in the developing world. Others, especially those with a more libertarian bent, believe that public programs should hardly exist in their own countries, let alone in others, and that individuals and corporations should be involved in charity work out of their own benevolence. There are great debates about these issues, and currently there does not seem to be one right answer. Thus, this MDG is excellent in concept, but it is very difficult to gauge its practical effect.

3.1.9: Summary and Weaknesses

In summary, the MDGs provide a measurable, "achievable" set of objectives, forming a global paradigm for development. Like all metric-oriented goals, though, the MDGs lend themselves to being followed "to the letter of the law," and not its true spirit, failing to accomplish all of the good intended by them. Also, because there can only be a limited number of goals, certain important aspects necessary for international development are left out of the goals and thus might be considered to be of secondary importance for development. Such categories include social justice, peace, education past the primary level, fair governance, and more (Smith, 2010). Of the eight goals as they stand, the greatest weaknesses I see are, as I have discussed, their:

1) **Failure to provide for adequate or meaningful education.** The second goal specifies that children should receive at least a primary education but does nothing to ensure quality of education, leading to some scenarios where children are left sitting

in their classrooms without a teacher while their peers are gaining skills by working in their parents' shop or elsewhere.

2) **Potential to not correct shortcomings in men and males in the MDGs' admirable efforts to empower women**. The third goal, to promote gender equality and empower women, is vital and should not be changed. However, programs to direct males—especially young boys—in how to mature into valuable members of society should not be ignored. This is not so much a shortcoming in the MDG design as it is an additional target for which to aim.
3) **Lack of focus on infrastructure to provide for basic human needs.** The seventh goal explicitly mentions access to adequate sanitation, but that is the closest the MDGs come to explicitly discussing infrastructure. While this is not surprising, infrastructure—whether simple or advanced, electric or sanitation, water or food, highway or medical—is of critical importance to the well-being of humanity and thus should feature more prominently in the MDG statements.

In conclusion, the MDGs provide a tangible set of metrics that form a practical paradigm of human development that, while flawed, have accomplished good for many and give a framework around which future paradigms can be built.

3.2: A Motivation for Aid

Having now reviewed the Millennium Development goals and gained an understanding of some of the aid efforts—in the broadest sense—taking place, let us move on to a pervasive and difficult question. Should we be involved in providing aid at all? Perhaps this should have been the first question addressed in this article, but I deemed it necessary to present the readers first

with a set of normative scenarios of global development before answering this. Like the other topics we have already discussed, there is more to be said on this subject than can be addressed in a single section of a single paper, but this segment will serve as an overview and introduction to the question through reviewing the ideas of two Manhattan-based academics—Jeffrey Sachs at Columbia University and William Easterly at New York University. Sachs and Easterly have much to say from opposite perspectives about aid and what the involvement of rich western nations should be in it. Both authors are interested in the good of humanity but argue for, for all intents and purposes, opposite approaches to aid. After examining their basic arguments, I examine work conducted by MIT economists Abhijit Banerjee and Esther Duflo to chart a course between both Sachs and Easterly's viewpoints.

3.2.1 Jeffrey Sachs Thinks We Can, and Should, End Poverty

Jeffrey Sachs, head of the Earth Institute at Columbia University and advisor to the United Nations, believes we need more aid to end extreme poverty. In 2005's *The End of Poverty*, he infectiously and optimistically argues that it is possible to end extreme global poverty by the year 2025. Examining the rapid development of the West in the past several centuries—before which Western nations were by no means wealthier or better off than their non-western counterparts—Sachs makes the case that the most impoverished nations are caught in a poverty trap. That is, people who live in poverty have no access to opportunities to better their stations in life—for themselves or for their children—so the poor keep staying poor from generation to generation. All they need, Sachs argues, is a little boost to begin climbing the "development ladder," in which the ascending rungs represent various stages of development, which may include some unsavory working conditions but that open the door for future opportunities. Once the poor are on the first rung of this ladder, they will be able to pull

themselves out of poverty; the trap will be broken. Banerjee and Duflo summarize his arguments:

> Poor countries are poor because they are hot, infertile, malaria infested, often landlocked; this makes it hard for them to be productive without an initial large investment to help them deal with these endemic problems. But they cannot pay for the investments precisely because they are poor—they are in what economists call a "poverty trap." Until something is done about these problems, neither free markets nor democracy will do very much for them. This is why foreign aid is key: It can kick-start a virtuous cycle by helping poor countries invest in these critical areas and make them more productive. The resulting higher incomes will generate further investments; the beneficial spiral will continue. (Banerjee & Duflo, 2011, p. 3)

Sachs argues that, were $195 billion dollars in aid to be given by the rich world to the poor each year from 2005 to 2025, poverty could be extinguished. He advocates for a clinical approach to development economics, in which development experts use a defined methodology to elicit the problems a poor nation is facing and then prescribe an aid-based solution to rectify the problems.

Sachs is a strong proponent of centrally controlled, top-down aid and sees it as the answer to poverty, to breaking the poverty trap. But his arguments leave one asking questions about how to deal with corruption, or how to implement or distribute aid efforts? Sachs is a firm supporter of the Millennium Development Goals and strengthening the United Nations as one of the key players in ending extreme poverty, but as we have seen, the MDGs do not perfectly solve poverty. In his sweeping view of ending poverty, forgiving debts, and making the world a better place, one is left asking two questions:

1) How should aid be practically implemented on the ground in a way that is effective and does not reinforce corrupt regimes?
2) Even if aid were to be successfully provided, would the beneficiaries of aid actually make use of it?

Sach's grandiose arguments for human empowerment do not address detailed, practical issues that may in fact cause aid to become altogether ineffective or potentially dangerous. We next examine a viewpoint that is cautious of, if not altogether opposed to, centralized foreign aid.

3.2.2 William Easterly: Aid Does Not Help

Not everyone is so enthusiastic about centrally-controlled foreign aid efforts. Some, in fact, are deeply suspicious or even opposed to them. One such skeptic is William Easterly, Professor of Economics at New York University and Co-director of the NYU Development Research Institute. Easterly is deeply suspicious of development experts, whom he terms "technocrats"—benevolent or otherwise—in his most recent book *The Tyranny of Experts: Economists, Dictators, and the Forgotten Rights of the Poor*. Easterly is vehemently in favor of improving the lives of the poor, even referencing Amartya Sen's ideas of human development, but he is leery of almost all imposed aid efforts to "help" those caught in poverty. Leveling his rhetorical gun at the aid establishment, says Easterly:

> The conventional approach to economic development, to making poor countries rich, is based on a technocratic illusion: the belief that poverty is a purely technical problem amenable to such technical solutions as fertilizers, antibiotics, or nutritional supplements. We see this in the [World] Bank's actions in Mubende; we will see the same belief prevalent amongst others who combat global poverty, such as the Gates Foundation, the United Nations, and US and UK aid agencies. (Easterly, 2013, p. 6)

He goes on to state succinctly that the real cause of poverty is the "unchecked power of the state against poor people without rights." (Easterly, 2013, p. 6) He does not accuse those in the modern development field of intentional violation of the rights of the poor—although he makes a strong historical argument for the racist and oppressive roots of much of the aid establishment—but instead argues that attempts at aid infringe upon and suppress the rights and thus the potential of the poor. He frames his argument around three pillars.

First, he argues that modern development efforts are based on a non-historical approach—what he calls the "Blank Slate"—in impoverished nations, when in reality the history and context of a nation has deep pertinence to the current state of the nation. The accusation echoes heavily of the criticisms of the Washington Consensus' use of performance-based metrics instead of historically significant ones. Easterly explores a variety of situations in which individual freedom, rather than state-led development efforts, have led to prosperous societies.

Second, Easterly asserts that the standard unit of analysis in aid work is the nation-state and the policies implemented by its government and/or other governing bodies. Instead, he claims, non-national factors such as technology, values, and human networks—and the individual human or community—not the nation-state and its policies, should be of primary concern in aid work.

Third, he believes that spontaneous solutions—not only in the marketplace but in government and technology as well—will fundamentally benefit a population more than top-down imposed aid efforts. To support all three of these arguments, Easterly draws on a number of new studies and historical anecdotes.

Easterly does not present a solution to poverty or recommend any direct actions whatsoever for improving the lives of the poor in this book, saying that it is not about the actions the aid community can take to end poverty but instead about the principles underlying the causes of poverty. If we can fix our understandings of the principles, then right actions will naturally emerge and poverty will be solved, most likely by those trapped in it themselves.

Easterly does not believe in poverty traps like Sachs does but instead believes that oppressive aid is what keeps people in poverty. In Banerjee and Duflo's words, Easterly and authors of similar convictions, such as Dambisa Moyo of *Dead Aid*, believe that:

> …aid does more bad than good: It prevents people from searching for their own solutions, while corrupting and undermining local institutions and creating a self-perpetuating lobby of

> aid agencies. The best bet for poor countries is to rely on one simple idea: When markets are free and the incentives are right, people can find ways to solve their problems. They do not need handouts, from foreigners or their own governments. In this sense, the aid pessimists are actually quite optimistic about the way the world works. According to Easterly, there are no such things as poverty traps. (Banerjee & Duflo, 2011)

Aid, as currently propagated by the development community, is at best a distraction from what would really help the poor and is, in more sinister cases, an oppressive set of actions that bolster corruption and rob the individual impoverished person of his or her rights in the name of progress.

3.2.3 Banerjee and Duflo: Aid Sometimes Works so We Should Keep Pursuing It

Jeffrey Sachs and William Easterly are both established academics with studies to support their respective arguments, and they both want global poverty to end. But they are diametrically opposed in their beliefs on how to end it. Sachs argues that we need a massive, top-down, clinical approach to give the poor a jump-start out of the poverty trap. Easterly argues that this is all wrong, that we simply need to back out and let the poor solve their own problems. Who are we to believe? Should we continue developing aid programs, or stop them altogether?

The answer is both and neither to each question. Sachs and Easterly each are right in some situations and wrong in others—humanity and its problems, including poverty, are massively complicated systems that fit one ideology in some situations and a completely different ideology in others. Sachs and Easterly are both trying to answer the macro-question of "Is centralized aid a good thing?", a question that is too broad to, at least in our time, be answered. The scale of such a question is simply too large. So, what are we to do?

Abhijit Banerjee and Esther Duflo, in their seminal *Poor Economics*, help us to ask a different question, or rather a different set of questions. Instead of trying to solve poverty in a single, concerted thrust, they help us to view it as a set of small, tangible problems that have

tangible solutions. "This book will not tell you whether aid is good or bad, but it will say whether particular instances of aid did some good or not." (Banerjee & Duflo, 2011, p. 5) We should focus not on "Aid" in the macroscopic but on "aid" applied to address particular problems in particular contexts. The rest of the book summarizes fifteen years of their own research and that of others using randomized control studies to test the effect of individual aid efforts in a variety of contexts and across a variety of specific development issues, including education, food, financing, and governance.

Instead of arguing that the poor are *all* stuck in a poverty trap, or that *none* of them are, Banerjee and Duflo test a variety of situations to find out whether aid is effective or ineffective in that particular context, or whether a poverty trap exists there or not. For example, they found that subsidizing staple foods such as wheat and rice so that study participants could consume more valuable calories—thus increasing their productivity and hence income—led in fact to a *decrease* in caloric consumption. The primary reason was because this led to a decrease of perceived value of the staple foods and an increase in spending, with the newly freed income, on tastier, less-nutritional calories. Top-down aid, namely subsidizing important foods, did not work in this situation.

In other cases, though, top-down aid has proven to be extremely valuable. A government-led educational effort in Mexico, named PROGRESA, paid parents to send their children to school using a system known as a conditional cash transfer (CCT). The effort massively increased school enrollment of the children of poor families. Simply getting kids to school, though, is not enough, and proper quality of education must be assured. When it is—as defined by various metrics that the reader is encouraged to examine and that Banerjee and Duflo explore

extensively—education provided through aid programs can indeed lead to significantly increased earnings and quality of life for the poor.

Thus, we cannot answer the final question of whether aid is "good" or "bad," whether it is always appropriate or not. The official position of this paper is to echo Banerjee and Duflo in saying that aid *can do good in particular circumstances, so we should continue to rigorously pursue aid programs that will do good—pushing towards an applicable paradigm of development—while being aware of their potential to be ineffective or even, potentially, harmful.* This means being acutely aware of times when aid may cause harm, and realizing that our conceived notions of what may be "good" for the poor may in fact not be "good," or that the poor may not be interested in participating in our programs. Both Sachs and Easterly can be right and wrong in different circumstances, and it falls on us as aid practitioners to carefully implement aid programs that do, in fact, do good and not assume that they will simply because they fall into the category of "aid."

4 A New Paradigm of Global Development

Having now reviewed a number of high-level global development ideologies, examined the Millennium Development Goals as a sort of practical paradigm and an attempt at globally reaching that objective, and defined a motivation for continued aid efforts, I now propose a new, simple paradigm for consideration. This is not an attempt at replacing the previous viewpoints. I simply provide this perspective—informed by and built on top of the others—as another viewpoint from which to approach and analyze poverty. A global issue like poverty has many faces, and thus many perspectives afford opportunities for understanding, discussing, and addressing it.

I provide no specific, tangible metrics or plans for how to reach this paradigm, but all components of it should be measurable to some degree or another, and in fact many of them are already being addressed in aid efforts already under way.

4.1 Paradigm for Human Development

What is the end goal of human development? What is the ideal state of mankind? Unfortunately, we live in an imperfect world where accidents happen, people get greedy and become corrupt, and selfishness weighs heavily both in others and ourselves, so Utopia is most likely out of the question. What, then, is a realistic goal for human development? Taking the ideas presented by Schumacher, Sen and Fukada-Parr, the MDGs, Easterly, Sachs, Banerjee and Duflo, as well as the knowledge that we live in an imperfect world, a new normative scenario for human development is as follows:

> *Every human should have an increasingly high probability of being able to choose to lead a healthy, happy life in which he or she is able to obtain access to the seven basic human services; given sufficient training to begin and sustain advanced learning; given the opportunity to work in a satisfying job that provides a sustainable income; given the chance to belong to, interact with, benefit from, and give back to some form of a local community; be under the governance of leaders who are held accountable for their actions; and be afforded consistent opportunity to live, work, play, grow, believe, and advance in a preserved environment, in any context, regardless of age, gender, race, or socioeconomic standing.*

There are six specific objectives of this paradigm, but before unpacking them, a note on their context. The first line states that "Every human should have an increasingly high probability of being able to choose to lead a healthy, happy life…" I say that there should be an "increasingly

high probability" not because I do not believe everyone should have a guaranteed "shot at life," but because I realize that perfection will never be obtained in this world. Accidents will always happen, injustices will be done, and innocent people will be robbed of their rights. However, by saying that the probability of a good life should be "increasingly high," I mean that we should never be content with injustice and accidents, we must always fight against them and watch them decrease.

By saying that "Every human should…be able to choose to lead a healthy, happy life," I am taking Sen's idea that "Capability," the objective of his archetype of human development, "reflects a person's freedom to choose between different ways of living." (Sen, 1989) While most humans agree on wanting to be happy and healthy, for whatever reason some individuals do not desire this, or at least not in the way that most of us would define it. My paradigm's caveat of being "able to choose" is a protection of the individual's right to pursue his or her own desires, even if those desires do not equate with what the developers and most other people imagine their desires should be. Of course there are exceptions to this freedom to choose in cases of mental illness, or when "choosing" will cause significant, tangible harm to the lives of other individuals, but in a general sense, an individual's freedom to choose what makes him or her happy must be protected.

4.2 Paradigm Objectives

There are six key elements to my reimagined human development paradigm. These are 1) access to the seven essential human services; 2) sufficient training to begin and sustain advanced learning; 3) satisfying work with a sustainable income; 4) opportunity for community; 5) governance of accountable leadership; and 6) opportunity to develop without discrimination in a preserved environment.

3.2.1: Essential Human Services

Humans are many things; one of the most notable of these is that we are physical beings with physical needs. If a human has no air, he dies quickly. If she has no water, she will die in a few days, and so on. In order to survive, we have certain physical requirements. Garrick Louis and Ali Bouabid state that there are seven "essential human services." (EHS) (Louis & Bouabid, 2013) These are 1) air, 2) water, 3) food, 4) shelter, 5) sanitation, 6) household energy, and 7) personal security.

These seven services are physically required by every human being, and without them no one could survive for long. One might argue that on a tropical island a human could survive without a hut for shelter, and this may be possible for a time, but for the average human in most parts of the world, all of these elements are required. Much work is already being done to provide these services around the world for those who lack reliable access to them. The Millennium Development Goals in fact provide for many of these needs. It is worth noting, though, that most of them require some form of access to infrastructure. I mention this here because the MDGs do not explicitly focus on infrastructure, but human survival foundationally depends on it to meet our basic needs. My paradigm thus strongly and directly links to infrastructure through the seven EHSs, in contrast to the MDGs, which only weakly link to it.

4.2.2 Educational Opportunity

My development paradigm states that every person should be "given sufficient training to begin and sustain advanced learning." This is a bold expression, surpassing the MDG's goal for education. However, as seen previously, the MDG's goal is too broad and firm, unintentionally causing children to pass through elementary education programs without actually learning much of anything. For this reason, my paradigm's goal is stated much more strongly. It is also less

specific, avoiding the exaction of "elementary education" because it acknowledges that learning can come through many different sources.

4.2.3 Employment and Wages

The first MDG is to "eradicate extreme poverty and hunger," and deals with wages and their ability to purchase food and other necessities. The economic element of my development paradigm, though, is listed third. This is because, in order to be able to work, a person must first have been given access to the seven essential human services and must have received some form of education or training, however elementary, before he or she can work. At some point, though, a job does become the means by which one provides himself or herself with continued access to most of the essential services and education, if he or she so desires. However, a job is, or at least should be, much more than merely a source of income necessary for survival. The Preacher in the Book of Ecclesiastes says: "There is nothing better for a person than that he should eat and drink and find enjoyment in his toil." (English Standard Version Bible, 2010) Schumacher agrees with this ancient wisdom, speaking of redefining the current ways in which most jobs are carried out: "everybody would be admitted to what is now the rarest privilege, the opportunity of working usefully, creatively, with his own hands and brains…" (Schumacher, 1973) Clearly, satisfaction in work should be not just based on the income it provides, but on the satisfaction it brings the workers and their overseers.

Of course, finding a job that simply makes ends meet is tough these days, even in the industrialized world, so speaking of finding completely satisfying work for everyone is far from being easily achievable. But still, satisfying work should be desired and sought after throughout all levels of society, from planners and presidents to laborers and librarians, because at the end of the day, it is how one lives and not what one owns that matters. The reader is referred to

Schumacher's work for a deeper analysis on finding satisfaction in work and the necessary societal changes to facilitate it.

4.2.4 Community

Schumacher strongly believed that community was essential to human well-being, and he believed that humans prospered most when they were connected to others around them. Indeed, the ideas of friends and family, the most intimate forms of community, are so ingrained in us that stating that humans need a community is almost redundant. To be sure, different people value communities differently; one need only briefly scan social media websites to find articles entitled something like "How not to Talk to an Introvert" or "15 Things Extroverts Do" to find out that some people like having active social lives with lots of people around them and others prefer only to have a small number of intimate friends. People place different values on different types of communities, and no one can dictate to them what type of community they should desire. Still, everyone should have the option to belong to some form grouping of other people with whom they can identify, receive help from, and provide help to.

Family is the most immediate form of community, at least for children, and arguably the most important for the majority of people. Other common types of community groups are neighbors and those who live in close proximity to oneself, school classmates, coworkers, religious organizations, and athletic groups.

4.2.5 Governance

Specific details, or even general ones, for that matter, outlining what constitutes a good government are beyond the scope of this paper, as government is and has been the subject of intense debate throughout human history, except to say that good governance is necessary for the development of successful—however success is defined—human societies. Fukuda-Parr, in her

"New York Consensus," states that good governments in the context of human development provide "political and social reforms for democratic governance that secures human rights so that people can live in freedom and dignity, with greater collective agency, participation, and autonomy." (Fukuda-Parr, 2003, p. 310) This is an ideal form of government towards which all societies should strive, but one that may be difficult in reaching in many contexts—the US trying to set up democracy in Afghanistan is one example in which implementing a new form of democratic government did not take too well.

Schumacher understands the connections between large-scale governing bodies and the order they provide and the liberty afforded by small-scale autonomous communities: "We always need both freedom and order. We need the freedom of lots and lots of small, autonomous units, and, at the same time, the orderliness of large-scale, possibly global, unity and coordination." (Schumacher, 1973) The ideals which Schumacher and Fukuda-Parr lay out are sufficient definitions of a government whose *"*leaders who are held accountable for their actions," as stated in my paradigm.

4.2.6 Opportunity without Discrimination and Without Environmental Harm

This final paradigm statement is, similar to the seventh and eighth MDG goals, exceedingly broad in the ground it covers, stating that those in developing societies should have the chance to "live, work, play, grow, and advance in a preserved environment, in any context, regardless of age, gender, race, or socioeconomic standing." There are two primary purposes in this statement. The first is to ensure that all human development "meets the needs of the present without compromising the ability of future generations to meet their own needs," (World Commission on Environment and Development, 1987) ensuring that the earth's physical environment is sufficiently preserved in the future. The second is to guard against unfair discrimination, particularly on the basis of age, gender, race, or economic status. This is in line

with Fukuda-Parr's belief that human development should pay "special attention to the downtrodden and the poor whose interests are often neglected in public policy, as well as discrimination against women." (Fukuda-Parr, 2003)

4.4 Summary

My presentation of a new paradigm of human development seeks to incorporate ideas from historical, high-level ideologies and is both practical—in reference to the need for infrastructure to provide for essential human services and in reference to the need for meaningful education—and summative—in reference to maintaining governance, the environment, and human flourishing. Specific metrics for the paradigm are not provided; that will be the subject of future work. I mean for this paradigm to be critiqued and discussed, to be compared against others, and, through this discussion, to foster a deeper understanding of what it means to pursue a better life for our fellow women and men.

5 Conclusion

Global development is a multi-faceted set of practices and ideologies aimed at improving the lives of suffering humans around the entire globe. While the underlying motivations of most of us who participate in such development efforts are assumedly benevolent, a simple, unified end-goal for development is elusive. In this paper, I have provided, through a literature review, an intellectual history of some of the most outstanding development ideologies and practices of the late 20th and early 21st centuries.

In the first section, I reviewed three of the most influential voices in shaping paradigms—very high-level objectives—for development. The neo-liberal Washington Consensus and its proclivity towards gauging development via a single metric—GDP—was discussed and its

weaknesses shown. In response to the Washington Consensus's simplistic and potentially harmful approach I reviewed E.F. Schumacher's ideas as presented in *Small is Beautiful*. He argues for community-based lives where humans use appropriate types of technology to accomplish meaningful work with their hands and find holistic fulfillment in their efforts, both physically and metaphysically. Also in response to the Washington Consensus, I reviewed Amartya Sen's ideas of global development serving to enhance human freedom and capabilities, a slightly more grounded and applicable approach than Schumacher's.

After reviewing these paradigms, I broadly examined, and lightly critiqued, the United Nation's Millennium Development Goals as one of the largest concerted applications of global development in our day. From there, using Jeffrey Sach's and William Easterly's opposing viewpoints, sought to answer the question of whether or not global aid is, in fact, a "good" thing, whether the lives of suffering people around the world are improved through our aid efforts or if their lives are hampered. Abhijit Banerjee and Esther Duflo's work guided this discussion and provided the conclusion that, while there are risks associated with aid and that the macro-level questions of aid may be unanswerable, we should still pursue aid to accomplish particular instances of good for particular people in particular circumstances.

In the final section, I presented a new paradigm for global development, inspired by the already-discussed paradigms and arguments for and against development. My new paradigm is not meant to replace existing ones but to provide an additional perspective on the aims and objectives of the multifaceted enigma that is global development in hopes of furthering discussion on what it means to improve the lives of our fellow women and men. I provide no detailed metrics for each objective of my paradigm, leaving that to future work by myself and others.

I am acutely aware of the limited scope of this paper and the massive swathes of the development world that have been completely left out of my discussion. The Human Development Reports, the World Bank, the IMF, USAID and other similar national aid groups, and thousands of NGOs working in development have been summarily ignored. This is not because they are unimportant but rather because my efforts in this paper have been to call for a deeper understanding of why we, as relatively wealthy aid practitioners with roots in the developed Western world, do and should participate in development.

I opened this paper by quoting my adviser's statement that there are no experts in fighting global poverty. He was right; no one has yet figured out how to end it and bring all citizens of the earth to a fair and equitable standard of living, but progress is being made. Let us in the development community continue to pursue the betterment of humanity with humility, patience, and tenacity; perhaps, someday soon, we will all become experts in the field together.

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2. Human Development through Low-Tech Vocational Education and Training:

Empowering the World's Most Vulnerable

J. Scott Remer

Abstract

Vocational Education and Training (VET) has reemerged on the global development frontier as a key focal point for human development initiatives. It is no longer treated as a sub-par means of providing employability training to people without other options but instead as a methodology for empowering the poor to live wholesome, self-actualized lives in line with Amartya Sen's Human Development paradigm. VET's reemergence coincides with the globally unprecedented spread of advanced technology and the knowledge economy; much of the global VET initiative feeds into producing workers for this new high-tech economy and is implemented through large-scale, nationally-driven initiatives. As valuable as these initiatives are, poor communities—rural ones in particular—across the globe that still lack reliable access to providing for the most basic human physiological needs stand to be left behind by advanced training initiatives; what they need is not better internet access but reliable water and sanitation infrastructure, along with other basic physical services.

In this paper, I conduct a literature review on the current state of VET and use the results as a backdrop against which to propose Low-Tech Vocational Education and Training (LTVET). LTVET is a category of VET meant to empower small communities without reliable infrastructure—or the necessary capacity for it—to develop appropriate infrastructure systems for themselves. LTVET provides a means of harnessing the development community's emerging VET momentum to ensure that low-capacity communities are not left behind in the international surge towards a globalized, knowledge-based economy. I utilize the concepts of the seven Essential Human Services (EHS)—seven physiological factors without which human flourishing is impossible—and the Capacity Factor Analysis—a methodology for determining appropriate technology for a community—to further round out the global need for LTVET.

I have not conducted any quantitative studies on LTVET: it is a novel conception for human development needing to be practically explored. There are myriad potential applications that could be implemented in a variety of contexts across the globe. Significant elements of any future LTVET initiative that need further exploration are those of pedagogy, funding, and forging connections with outside resources and stakeholders. LTVET, like its parent idea VET, is not a "silver bullet" for ending poverty, but it is another potential tool in the quest to alleviate poverty and human suffering.

Keywords:

Vocational Education and Training, Global Development, Human Development, Appropriate Infrastructure, Essential Human Services

1 Introduction

"Education is the most powerful weapon which you can use to change the world." Nelson Mandela's proclamation rings ever truer as humanity lurches headlong into the global, knowledge-based economy, a society where skills, technical and non-technical know-how, and work- and life-related competencies gained through study are increasingly necessary to prosper. "Education," though, is a broad term with many nuances, requiring detailed objectives and concentrated effort from both the supply and the demand side: what type of education is required? How long a course of study is necessary? Who is being educated, children or adults? Who should pay for and provide education? Are we seeking simply to impart technical skills ready for the workplace, or are we aiming to provide a more holistic, general education?

These questions permeate education policy for decision makers around the globe. The global development community strives to improve education systems in the world's poorest nations while still struggling to decide on education policies at home.[5] Global attention in recent years has heavily focused on providing global access to primary, general education. Indeed, the second Millennium Development Goal (MDG), to "Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling," (United Nations, 2015) embodies this multi-lateral focus and has driven aid entities to strive for general, primary education programs and policies. However, a significant amount of attention is being shifted away from general primary education, as some of the weaknesses of this approach are becoming apparent at the end of the MDGs (Banerjee & Duflo, 2011), and instead shifting to

[5] Wealthy, developed nations are struggling with domestic education policy. For example, the United States' No Child Left Behind act of the previous decade was highly controversial and was even considered harmful by some (Murnane & Papay, 2010), while its replacement with the Common Core policy is no less controversial (Burks, et al., 2015).

what is generally referred to as skills training, vocational education, or vocational education and training (VET), as it will be referenced through the remainder of this paper.

VET—in all of its varying forms and applications—is no new concept and is in fact an established approach to empowering workforces in both the developed and developing nations. However, a series of late 20th century reports and studies, largely commissioned by the World Bank (e.g. (Foster, 1965) (Psacharopoulos, 1981) (Psacharopoulos, 1985) (Psacharopoulos & Loxley, 1985) (Heyneman, 1985)) and a belief of VET being a "second-class" option for those incapable of succeeding in the more-preferred general education, drew attention away from VET in the development community. In recent years, though, VET has experienced a renewed interest as a pathway towards human development (McGrath, 2012) and, while certainly not center-stage in education policy discussions, is growing in prominence.

This paper acknowledges the re-emergence of VET as a means towards holistic human development ((Marope, Chakroun, & Holmes, 2015) (McGrath, 2012) (Allais, 2012)) but recognizes that most VET discussions—even in context of the developing world—are large-scale, macro, policy-oriented discussions geared towards supplying workers—holistically empowered though they may be—to the global marketplace. My purpose in this paper is to propose a novel conceptualization of VET as a local, small-scale means of empowering those trapped in poverty in the world's most vulnerable communities—those lacking access not only to the global economy but to basic human survival needs, e.g., clean water and improved sanitation. I term this form of VET "Low-Tech Vocational Education and Training" (LTVET) and call for its further exploration and implementation as a global aid initiative.

In the first section of this paper, I briefly explore the resurgence of VET as a means to human empowerment in the developing world. I do not provide an exhaustive discussion here, as

a wealth of literature surrounds the topic, but I provide a backdrop for my proposal of LTVET. In the next section, I explore the concept of community capacity building for impoverished communities lacking access to essential infrastructure, even if that infrastructure is decidedly "low-tech." I explore the concepts of seven essential human services (EHS) (Louis & Bouabid, 2013) as necessary, although not sufficient, services for human flourishing and using appropriate levels of technology to meet a community's needs.

In the final section, I propose LTVET as a novel aid approach to helping a community increase its access to essential infrastructure through training its citizens to be developers of essential infrastructure, thus increasing community access to EHS's. In an international economy that is continuously advancing technologically, those with technological access and know-how leap ahead, while those without fall ever further behind in pockets of poverty and destitution. If a majority of our global VET programs are geared towards increasing technological know-how, then those without access to the most basic human needs—needs requiring knowledge but not "high-tech" knowledge—will be left behind to their detriment. I propose LTVET as a way to harness the momentum newly imbued to VET to ensure that these most impoverished pockets of society can lay the basic infrastructural foundations necessary to provide for their basic needs and further grow from there. I do not fully flesh out the concept of LTVET and leave many questions as to the practical implementation of a LTVET program unanswered; I flesh out a more practical conceptualization elsewhere. (Remer, 2016) My purpose in this paper is simply to introduce LTVET as a conversation point and category of development thinking.

1.1 A Note on Scales and Stakeholders

As the ideas I present in this paper vary in scale and scope, so the associated stakeholders and decision makers vary based on the context in which the ideas are applied. Initially, I discuss

VET as a global concept for improving the jobs and lives of humans around the globe[6], meaning that all of humanity can be considered stakeholders; heads of state, leaders of international organizations, and international experts can be considered decision makers. However, the real worth of VET, and in particular LTVET, comes as it empowers individual people and the communities they comprise to live better, more fulfilling lives. In this sense, VET and LTVET should be very small-scale discussions in which stakeholders are local community members—potential students and citizens who benefit from having these students in their community—and decision makers are leaders in the local community empowered by regional, state, or national leaders. Different VET/LTVET scenarios will vary in scope and applicability based on their intended implementation, but those of us in the development community must not forget to appropriately recognize the appropriate parties affected by our planning and projects.

2 Current State of VET: A Literature Review

This section provides a brief summary of the literature surrounding the concept of Vocational Education and Training (VET) in the developing world. While not exhaustive, this discussion erects a backdrop against which to build the concept of LTVET. VET is experiencing a resurgence in the development community, both from a policy and academic perspective (McGrath, 2012) and carries with it the potential of holistically improving human lives.

[6] VET is not simply a methodology applied in the developing world. Technical skills training and trade schools feature heavily in developed nations' efforts to educate their populaces and strengthen their economies (Allais, 2012). VET policy is then a developed- and developing-world conversation, having stakeholders and decision makers in both contexts, and is thus truly a global initiative. In this paper, though, I am focusing only on VET in the developing world.

2.1 The Elusive Definition of VET

Vocational education and training (VET), technical vocation and training (TVET), vocational education (VE), and skills training are common terms found in the literature when referencing non-general education with some primary focus on empowering students with competencies needed to work a job. While each term has nuance and different meanings (Allais, 2012), they are also interrelated and, on occasion, used interchangeably, making a cohesive definition based on the literature tricky. In fact, a clear definition of labour market skills, let alone training to develop those skills, is very difficult to reach and is highly dependent on social and political context:

> "As a historical concept, skill is a thundercloud: solid and clearly bounded when seen from a distance, vaporous and full of shocks close up. The commonsense notion—that 'skill' denotes a hierarchy of objective individual traits—will not stand up to historical scrutiny; skill is a social product, a negotiated identity." (Tilly, 1988, p. 452)

As a general concept, most of us have an intuitive understanding of what is being referenced by skills training or VET, but differentiating it from general education and setting specific goals and metrics for it is not straightforward. Education International (EI), in a sweeping literature review of VET, claims that:

> VET is important as it enriches a person for life and it provides the competences which are necessary in a democratic society. Societal and economic development depends on the strength of VET as it provides access to skills and entry routes into the labour market. For under-privileged and marginalized groups in particular, it can be an important route towards a better life. (Education International, 2009)

But what makes this any different than general elementary or higher education? One may say that EI's conception stresses "entry routes into the labour market." But, one may ask, does not general education in fields such as medicine and engineering provide a direct entry route into the workforce? (Karmel, 2011) In fact, EI's statement almost relegates VET to those who are

unable to obtain a more prestigious general education, stigmatizing VET into a stepping stone for the underprivileged that more-fortunate members of society systematically avoid, a stigma that the VET community is seeking to overcome. (Cheng, 2010) In their defense, EI does go on to acknowledge that VET is difficult to define, using a plumber and a surgeon to explain why: a plumber—a representative of VET—must use general knowledge concepts to make calculations and accomplish his work, and a surgeon—representative of standard higher education—must skillfully and practically use his hands to do his job.

Defining VET becomes even more problematic when considering who provides it, whether it should be a public or private enterprise, what level of "competency" is desired out of the program, or whether it should include both formal and informal learning scenarios. Tom Karmel, speaking within the Australian context, argues that defining VET is "As clear as mud" (Karmel, 2011, p. 6) but stresses that VET and standard education vary based on funding arrangements and pedagogic traditions. Regarding pedagogy, he says "The curriculum for higher education courses is based on notions of knowledge and understanding, while VET courses are based on the concept of competency. The interpretation of competencies is relatively narrow, being based on the tasks and skills required." (Karmel, 2011, p. 6) This leads into one of the primary arguments against VET as a tool for global development, that it serves the capitalistic trends of the neoliberal paradigm, only providing workers with the skills needed by legacy neoliberal employers and not meeting the needs of the whole person. I will discuss this argument in the next section.

Perhaps it is not necessary to explicitly define VET and differentiate it from other forms of education, except to have a general conception of it as a means of imparting skills and

competencies to people, both for their own benefit and for that of the surrounding economy. Says Simon McGrath:

> In the broadest sense, VET is conventionally understood as encompassing the myriad forms of learning that are primarily aimed at supporting participation in the worlds-of-work, whether in terms of (re)integration into work or increased effectiveness of those currently defined as being in work. Nonetheless, even this tentative definition is problematic. The notion of "being in work" is frequently used in ways that ignore much of female labour, whilst the focus on "worlds-of-work" can lead to the exclusion of a consideration of the broader notion of the vocation of being human. Indeed, the limitations of any such definition lie at the heart of the concerns of this article. To make my task possible, I will proceed with an assumption that *VET is a set of practices and technologies more than a clearly defined concept.* ((McGrath, 2012, p. 624), emphasis added)

Thus, formally defining VET in a rigorous manner is no easy task, and there is no consensus in the literature as to a rigid definition. Perhaps this is just as well, though, as it allows VET to vary based on the specific needs it addresses in the myriad contexts to which it is, and can be, applied throughout the globe. In this article, I hold that VET is both like Tilly's "thundercloud"—easily understandable from a distance but ambiguous in the details—and McGrath's conception of it as a "set of practices and technologies."

2.2 VET for Human Development

One of the reasons VET has not received more attention in the development community in past decades is that it is often associated with the neoliberal approach to human development, namely the idea that economic growth—measured as an increase in GDP and other ahistorical metrics (Gore, 2000)—through free and open markets is society's ultimate goal. Within this development paradigm—notorious for ignoring holistic human needs at the behest of greedy businesses and stockholders—VET is seen as producing laborers with skills demanded by industrialized capitalists so that the economy can grow, with little concern for the personal,

human development of the students. Anderson explains this perspective, that VET/TVET is a form of "productivism" (McGrath, 2012), and is worth quoting at length:

> …cast within the ethos of productivism and the ideological framework of neoliberalism, the institution of TVET is based on a restricted and instrumental view of lifeworlds which reduces people and the environment to the status of human and natural resources for economic exploitation. Such a perspective overlooks the complex and interdependent nature of human existence, the source and meanings of which are inextricably linked to the social relations, cultural practices and natural material conditions. TVET students are not only already, or aiming to become, workers. They are also human beings and citizens with a wide range of needs, relationships, duties, aspirations and interests beyond work; in the family, the local community, in civil society and the global environment. Over their life course, they give birth, raise and care for family members, consume goods and services, manage finances, fall ill, experience unemployment and hardship, elect governments, get involved in community affairs and ultimately rely for their survival on the fruits of nature. Yet in TVET they learn only to labour and produce commodities. (Anderson, 2009, pp. 44-45)

McGrath agrees with Anderson's sentiment regarding VET's propensity to ignore human needs, but McGrath argues, in line with Watson (Watson, 1994), that VET's history is more rooted in the 1960's early push towards development through industrialization and production, overseen by the state and not necessarily the free market, than in free market capitalism. (Hence the continued massive involvement of state governments and public agencies in VET even today, which one would not expect if VET was rooted purely in market-based capitalism).

In recent decades, the development community has shifted paradigms from the Washington Consensus's neoliberal approach to more holistic, human development approaches. E.F. Schumacher's 1973 classic *Small is Beautiful* called for economic activity that employs "appropriate technology," satisfying true human needs while being kind to the environment. (Schumacher, 1973) Beginning in the 1980's, Amartya Sen began calling for development to work towards enhancing human freedoms and capabilities through increasing people's capacity for "doing and being." (Sen, 1989) (Sen, 1999) Sen's work, along with others (e.g., (Haq, 1995)),

sparked the United Nation's Human Development Reports in 1991, defining human development thus:

> People are the real wealth of a nation. The basic objective of development is to create an enabling environment for people to live long, healthy and creative lives. This may appear to be a simple truth. But it is often forgotten in the immediate concern with the accumulation of commodities and financial wealth. (UNDP, 1990)

As the larger body of development experts has increasingly shifted towards this Human Development Paradigm, so has the new literature surrounding VET. Whereas VET was previously conceived as a means of simply providing job-training for economic growth—both personal and societal—it is now considered training for the "vocation of being human." (McGrath, 2012, p. 624)

Recent conceptions of VET for development have sought to holistically incorporate human development—in line with Sen's and Schumacher's paradigms—into their approach. McGrath refutes the arguments against VET for human development as outmoded and examines VET through the lenses of 1) human rights, 2) capabilities, and 3) integrated human development as defined by the Catholic Church tradition. He states:

> Taken together, these three elements of the broader human-centred development tradition do not provide a new theory of vocational learning for development. Rather, their value is threefold. First, they show why we need to get beyond current narrow conceptions of VET. Second, they offer some fruitful directions for wider debate regarding the purposes, natures and possibilities of VET. Third, they encourage a shifting of the focus of VET research away from the domination of a technicist view that privileges a focus on systems and institutions, and their efficiency, towards more humanistic approaches that place individuals at the heart of research, as subjects as well as objects. (McGrath, 2012, p. 630)

The third International Congress on Technical and Vocational Education and Training, held in Shanghai in 2012, entitled "Transforming TVET: Building skills for work and life" echoes McGrath's call for adapting TVET away from simply providing technical skills to

empowering people to meet their holistic needs, "…contributing to more equitable and sustainable patterns of human development…" (Third International Congress on Technical and Vocational Education and Training, 2012, p. 1) The conference argued that TVET for development must take a long-term approach to not only contributing to economic growth but to foster social equity. In their 2015 book summarizing the global state of TVET—as heavily influenced by the 2012 conference in Shanghai—Marope, Chakroun, and Holmes state that TVET for development should be evaluated on three criteria: sustainability, equity, and economic growth. (Marope, Chakroun, & Holmes, 2015) Each of these are buzzwords that fit squarely within the culture of the development community, but nonetheless they represent important objectives towards which not only VET/TVET but all development efforts should strive.

As seen in the literature discussed, VET and TVET are now—at least in some major global contexts—geared towards providing for holistic human development, representing a shift away from the traditional neoliberal approach to VET. I will now briefly explore some of the most pressing infrastructural needs of developing communities and the concept of capacity building, and then propose Low-tech Vocational Education and Training (LTVET) as a new VET category towards human development on the individual and small-community scale.

3 Low-Tech Needs and Community Capacity Building

Global society is leaping into the increasingly digital future, a world in which internet access is a human right not to be denied by governments, an "indispensable tool for realizing a range of human rights, combating inequality, and accelerating development and human progress." (United Nations, 2011) Advanced technology continues to permeate all levels of society; mobile phones

and their facilitation of enhanced communication are ubiquitously distributed in developing societies just as in developed ones. But, as valuable as access to the internet and advanced technology is, humans cannot satisfy literal, physiological thirst with the World Wide Web. 780 million people worldwide still lack access to clean water, and 2.5 billion lack access to adequate sanitation. (UNESCO Water Corporation 2013, 2013) Internet access does not provide improved sanitation—although mobile phones may provide an interesting distraction while taking part in that human activity that necessitates sanitation facilities. In fact, more people in the world have a mobile phone than they do a toilet. (WHO, 2015) (ITU, 2015) While increased internet access may indeed facilitate development—perhaps community members could learn about the need for sanitary practices for human waste through the Internet—it also does little to meet basic human needs. In fact, a dominant usage of the internet in developing nations is simply by young men to "play video games and watch porn." (Toyama, 2014)

Modern society is bifurcating—one segment has and continually gains increasing access to technological resources in addition to fundamentals like shelter, sanitation, and water. The other segment lacks basic essentials for physiological survival. Increasing the access of the latter group to advanced technology will do little to solve that group's foundational needs for water, food, or sanitation. Rather, the latter group must be empowered with access to means of meeting their foundational needs before advanced technology should be their primary concern. Advanced, digital, technological progress and spread must not eclipse the most essential, physiological needs of human bodies and communities.

3.1 Infrastructure and the Essential Human Services

Maslow's Hierarchy of Needs places physiological requirements at the bottom of the pyramid of human development, making them foundational to all other aspects of human growth. (See Figure 1) While Maslow's construct of human development is dated and perhaps over-simplified, its conception of air, food, water, and shelter as the most basic necessecities for human flourishing is a truth not likely to disappear, at least as long as humanity continues to inhabit physical bodies.

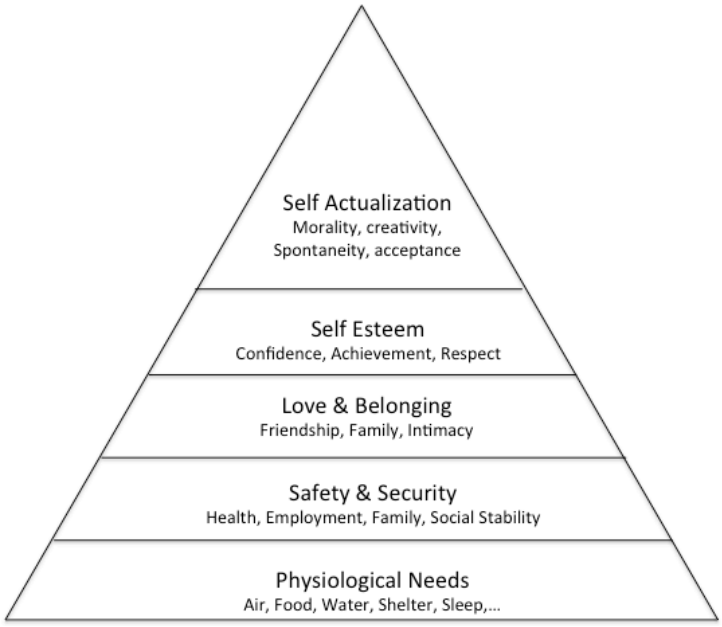

Figure 1: Maslow's Hierarchy of Needs

Adapted from (Louis et. al, 2015) and http://communicationtheory.org/maslow%E2%80%99s-hierarchy-of-needs/. 02.26.2016.

Louis and Bouabid have distilled the most foundational physical elements necessary for human survival into what they term the seven Essential Human Services (EHSs). These are 1) breathable air, 2) clean water, 3) food, 4) shelter, 5) adequate sanitation, 6) household energy, and 7) personal security. (Louis & Bouabid, 2013) These seven services are physically required by every human being; a complete lack of them would lead to death, while limited access to them devastates quality of life. One might argue that in certain circumstances—e.g., on a tropical island—a human could survive without a hut for shelter, and this may be possible for a time, but for the average human in most parts of the world, all of these elements are required.

An individual human—even a small group of humans—in the wilderness may be able to provide the EHSs for themselves in an ad-hoc fashion. However, in nearly all forms of

established communities, infrastructure is the primary means through which these services are provided. Infrastructure—whether water treatment and distribution systems; highways and shipping capacity; or electricity generation and distribution—provides the bones for societal well-being. Infrastructure is a broad term, applicable to numerous systems, from tangible ones like water distribution networks to intangible, ever-evolving ones like computer networks and information distribution channels, and it always involves some degree of technological development.

In this paper, I am interested in foundational infrastructure systems that provide access to the EHSs, and I am most interested in water and sanitation (WATSAN) infrastructure to help the 780 million people lacking clean water and the 250 billion lacking adequate sanitation. (UNESCO Water Corporation 2013, 2013) WATSAN infrastructure technology has existed for millennia; Roman aqueducts and Persian cenotes provided civilizations with access to water centuries, even millennia, ago (Nazemi, 2015) and yet millions today still lack access to this most basic technology and its benefits.

3.2 Capacity Factor Analysis for Appropriate Infrastructure

There is no shortage of global effort to bring adequate WATSAN systems to those who lack them, but the success rate of these projects is relatively low; a review of water system sustainability across eight developing nations found a water project failure rate of between 20 and 40 percent. (Lockwood & Smits, 2011) (Water.org, 2016)

I am not here providing a summative review of why WATSAN projects fail in developing contexts, but certainly one reason is the use of inappropriate technology. For example, gifting a reverse osmosis water treatment system to a developing community with a polluted water source may be a well-intentioned and financially generous effort, but it is doomed

to fail unless the community has the capacity—whether social, technical, economic, or other—to maintain the system. The machine may be able to adequately remove every single waterborne pathogen and pollutant from the polluted water source, but if the community lacks the resources to maintain it, the machine will be of no use to the community once it breaks down.

Louis and Bouabid argue that the use of inappropriate technology in low-income communities is one of the primary causes for infrastructure failure, and they propose a solution. The Capacity Factor Analysis (CFA) is a holistic method useful for determining a community's ability to construct and maintain water and sanitation infrastructure. (Louis & Bouabid, 2013) In its current form, the CFA is useful for matching communities to appropriate WATSAN technologies, which may seem slightly removed from my discussion of VET, TVET, and LTVET. However, I discuss the CFA briefly here as a potential methodology for identifying community needs which VET/TVET/LTVET could be useful in addressing.

A developing community's capacity level (CCL) for water and sanitation infrastructure is determined by 8 capacity factors: 1) Institutional, 2) Human Resources, 3) Technical, 4) Economic and Financial, 5) Environmental and Natural Resources, 6) Energy, 7) Social and Cultural, and 8) Service. (Louis, 2002) Each of these factors are further divided into several constituents. The CFA works through a facilitator assessing each constituent of each factor through interaction with local community members and through observations, then assigning a score to each constituent. "These constituents are assessed on a five-fractiles scale that partitions the space of a community's capacity to manage municipal sanitation service technologies. The assessment is based on the level a community can manage a WATSAN technology rated on a five-level scale, where every level is on a range of 20 points," (Louis & Bouabid, 2013) making the score of each constituent of a capacity factor range between 1 and 100. The score of the

actual capacity factor is determined through a weighted sum formula, giving the capacity factor a score between 0 and 100. Capacity factors with scores in the range of 1-20 are considered "Stage 1," 21-40 "Stage 2," and so on up to Stage 5 for 81-100. Table 2 shows the interpretation and community profile of each stage for a capacity factor.

Stage	Interpretation	Community Profile
1	High Entropy	Initial stage where there is no formal public service provided
2	Pre-Community	Limited local service provided with no regulatory or administrative control
3	Community- Based	A mix of public and informal private service is provided with minimal controls
4	Centralized	Regional public service is provided with adequate controls
5	Diversified	Regional public and selective private service is provided with improved controls

Table 1: Community Stages of Development (Basis for CCL rating). Taken from Louis and Bouabid 2013

The numeric value of the lowest-scoring capacity factor is conservatively counted as the community's capacity level. For example, if the Social capacity factor score for a community in rural Cambodia were 46, but its Human Resources score was the lowest of all the other factors at just 29, then the community would receive a Capacity Factor Rating of 2, "Pre-Community."

After a community's capacity score is found, then that score is used to sort through a list of WATSAN technologies that experts have decided are appropriate for a community at that level of development. So, for our Cambodian village with a Capacity Factor Rating of 2, possible sanitation systems that would be appropriate for that community might be a septic tank with a drainfield, soil aquifer treatment, or stabilization ponds. (Louis & Bouabid, 2013)

The seven Essential Human Services are foundational physiological needs for human survival; they are necessary but not sufficient for human development. Of these seven services,

lack of access to clean water and adequate sanitation pose some of the greatest risks to the citizens of the developing world. These risks can be mitigated through the careful use and implementation of appropriate infrastructure, and the Capacity Factor Analysis provides a means of identifying such appropriate infrastructure for different communities. In the next section, I propose Low-Tech Vocational Education and Training (LTVET) as a novel extension of current VET/TVET efforts meant to aid communities in developing their own infrastructure systems.

4 Low-Tech Vocational Education and Training for Low-Capacity Communities

Here I provide a brief, conceptual introduction to Low-Tech Vocational Education and Training (LTVET). LTVET is a means of directing the renewed global fervor and interest in VET/TVET for human development towards meeting the needs of people living in poor communities lacking access to the most basic of human needs, primarily water and sanitation infrastructure. This is a theoretical, ideological introduction of LTVET, not a prescription of how it should be applied and certainly not a summary of its effects and results. LTVET programs must first be implemented and analyzed before one can say whether LTVET is an effective development approach, so my purpose here is to introduce it to the development community as a category for human development efforts to be tested in the future.

LTVET is a proposed methodology that seeks to provide technologically-appropriate infrastructure to rural and impoverished communities—with low capacity for infrastructure—through training local "unskilled" or "uneducated" individuals using a modified version of the TVET approach. The ultimate goal of LTVET is taking another step towards human development by providing for impoverished peoples' lack of access to the essential human

services. I use "low-tech" in the name to clarify that advanced, "high-tech" solutions (e.g., the reverse osmosis treatment system I discussed earlier) are not necessarily needed or even appropriate for community development. Despite the global obsession with the knowledge economy and its associated highly-technical skills—and thus our interest in imparting those technical skills to developing communities—sometimes the most appropriate answers to the most pressing human issues are decidedly low-tech, simple, requiring only a small amount of direction, training, and effort. It is this thought that motivates my proposal and exploration of LTVET as a pathway towards human development.

4.1 LTVET Definition

Just as VET is a difficult-to-define concept—a "thundercloud" that is clearly distinguishable from a distance but murky up close—so too LTVET is not easy to delineate. I define it as follows:

> *LTVET is a generic, categorical approach to providing skills-based education—informed by ethical concerns for the well-being of fellow humans—for members of impoverished communities as lack access to the most fundamental forms of water, sanitation, and other infrastructure necessary for human survival and flourishing. LTVET imparts knowledge and skills to community members, empowering them to develop their own grass-roots infrastructural systems at appropriate technological levels and provides students with knowledge of resources available to them for developing these systems.*

This is a working definition open to change, but it stresses a few key aspects of LTVET. First, LTVET cannot operate in a vacuum; it would be out of place in a world dominated by the neoliberal paradigm of development. An LTVET program aims to produce graduates with skills that the community needs but for which it may be unwilling or unable to pay. Potential

employers of graduates from traditional VET programs—whether local companies or transnational corporations—will likely not be searching for employees with basic skills in building gravity-fed water standpipes (for example) and will instead be looking for employees with knowledge-economy skills, even if the community desperately needs gravity-fed standpipes. In order to provide benefit to the community—and to the individual LTVET students—external funding and support must be provided. This support may come from government programs, from private donors and agencies, or from NGOs and non-profit organizations.

Second, LTVET students must be willing to work for the good of their community, not simply for the increased income provided by education. On one of my trips to Sub-Saharan Africa I interacted with a number of transportation engineering students at a national university. When asked about why they were studying engineering, the answer was overwhelmingly that there was money in it, and they wanted to earn money. This is a driving motivation for all of us, but it is especially relevant for those who are, or have been, subject to the ravages of poverty. LTVET systems must be implemented such that they encourage students to think not only of their own income but the good of their community. Simultaneously, they must be implemented in such a way as to provide for the students' needs.

Third, the aims of LTVET programs will be highly, inextricably dependent on the specific communities in which they are implemented. The pedagogical approach to LTVET programs will entirely depend on the needs of the community, the level of knowledge/education already existing in the community and the potential LTVET students, and the local and regional opportunities for the students.

4.2 Goals, Stakeholders, and Pedagogy

The overarching goals of any LTVET initiative will be to benefit the individual students and the surrounding community in line with a holistic, human development paradigm, such as presented in the United Nation's Human Development Reports. (UNDP, 1990) Beyond these objectives, though, specific metrics of success will vary depending on context. It is common for educational initiatives to measure their success by numbers of students enrolled and graduated. However, this metric is a weak indicator of success. As Banerjee and Duflo note: "…all over the Third World, little boys and girls who help their parents in their family stall or store do much more complicated calculations [than children in school] all the time, without the help of pen and paper." (Banerjee & Duflo, 2011, p. 75) Clearly simple enrollment in an educational program is not an indicator of successful education.

If the context of the LTVET initiative is a rural village that lacks access to clean water, then perhaps reasonable metrics would be twofold: numbers of villagers that have gained access to clean water some period of time after students have begun graduating from the LTVET program and yearly income for the program graduates. Whatever the context, it will be vital that the program designers choose appropriate, meaningful metrics, as systems tend towards their indices of performance. (Gibson, Scherer, & Gibson, 2007) If these indices are meaningful, the system produces meaningful results; if not, then the system is useless at best and causes harm in worse cases.

System stakeholders will vary with the scope of the LTVET system. On a policy or funding level the stakeholders may include international donors, agencies, and heads of government departments and programs. On an applied level, though, the stakeholders will involve teachers, community members, students, and local representatives of financial backers. As with most

every development effort, clearly identifying the scope of the initiative and properly identifying the stakeholders and decisionmakers at the proper scale is vital.

Finally, pedagogy will, as with stakeholders and metrics, be highly dependent on the specific, applied goals and contexts of each TVET initiative. I will not seek to flesh out LTVET pedagogical needs here, as they vary with context and can be developed and adapted from existing VET and TVET techniques. But, from a generic perspective, there may be a need to incorporate some general education elements, such as basic mathematics and reading abilities, in some regions (Marope, Chakroun, & Holmes, 2015) while in others such skills may already be present throughout the local populace, or they may be unnecessary to the ends of creating improved infrastructure. LTVET initiatives will require teachers who are familiar with local needs and able to accurately impart knowledge; finding, training, and paying such teachers will be heavily dependent on the LTVET decisionmakers and general program goals and structures.

In addition to a pedagogy directed at the LTVET students, a certain community pedagogy will need to be developed as well. Training local students to develop infrastructure may indeed result in adequate, technologically-appropriate infrastructure being developed in the community, but there is no guarantee the community will make use of it. In order to convince villagers in Bangladesh to curb open-defecation practices, which resulted in high levels of community sickness, the Community-Led Total Sanitation (CLTS) approach was developed. CLTS, started in 2000, motivates villagers to cease open defecation by employing a trained, local facilitator to help the community see the health benefits of developing latrines by publically mapping the locations where community members defecate, in effect embarrassing them into taking action. (Institute of Development Studies, 2011) Such a model could be mirrored in motivating the community to use the infrastructure developed by the LTVET graduates.

5 Conclusion

Vocational Education and Training (VET) has reemerged on the global development frontier as a key focal point for development initiatives. It is no longer treated as a sub-par means of providing employability training to people without other options but instead as a methodology for empowering the poor to live wholesome, self-actualized lives in line with Amartya Sen's Human Development paradigm. VET's reemergence coincides with the globally unprecedented spread of advanced technology and the knowledge economy; much of the global VET initiative feeds into producing workers for this new high-tech economy and is implemented through large-scale national initiatives. As valuable as these initiatives are, poor communities—rural ones in particular—across the globe that still lack reliable access to the most basic human physiological needs stand to be left behind by advanced training initiatives; what they need is not better internet access but reliable water and sanitation infrastructure, along with other basic physical services.

In this paper, I have conducted a literature review on the current state of VET and used the results as a backdrop against which to propose Low-tech Vocational Education and Training (LTVET). LTVET is a category of VET meant to empower small communities without reliable infrastructure—or the necessary capacity for it—to develop appropriate infrastructure systems for themselves. LTVET provides a means of harnessing the development community's emerging VET momentum to ensure that low-capacity communities are not left behind in the international surge towards a globalized, knowledge-based economy. I used the concepts of the seven Essential Human Services (EHS)—seven physiological factors without which human flourishing is impossible—and the Capacity Factor Analysis—a methodology for determining appropriate technology for a community—to further round out the global need for LTVET.

I have not conducted any quantitative studies on LTVET: it is a novel conception for human development needing to be practically explored. There are myriad potential applications that could be implemented in a variety of contexts across the globe. Significant elements of any future LTVET initiative that need further exploration are those of pedagogy, funding, and forging connections with outside resources and stakeholders. LTVET, like its parent idea VET, is in no way a "silver bullet" for ending poverty, but it is another potential tool in the quest to end poverty and human suffering.

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3. Building Community Capacity for Infrastructure Through Empowering Disadvantaged Youth

J. Scott Remer

Abstract

In this article, I am concerned with two global issues related to human well-being. The first deals with developing communities' lack of access to basic human services provided through infrastructure, e.g., access to sufficient quantity and quality of drinking water and sanitation services; we may call a community's ability, or lack thereof, to produce and sustain such infrastructure its "capacity." The second global issue is the plight of children and young adults who have no sustainable care system around them—such as is normally provided through parents or extended family: street children, unskilled and unemployed young adults from impoverished backgrounds, and youth with families unable to care for them because of death or poverty—all fit into this category.

Globally, 780 million people lack access to clean water, and 2.5 billion lack access to adequate sanitation services. UNICEF reports that 132 million children in sub-Saharan Africa, Latin America, Asia, and the Caribbean have lost at least one parent, and 13 million globally have lost both. Rather than view the global lack of water/sanitation and the abundance of marginalized children and youth as two separate challenges facing the development community and the human race, in this paper I propose an approach for empowering disenfranchised youth in poor communities—communities as lack access to sufficient infrastructure—through engineering and technical education. The newly-empowered youth, in turn, increase their communities' infrastructure capacity and develop new, technologically appropriate water or sanitation systems which in turn benefit all members of the local community. This proposed approach, then, works on a micro-scale, benefiting the individual youths who receive the training through providing improved employment prospects and purpose, and it works on a macro-scale to improve the lives of all community members. I term this approach the "Community Infrastructure and Empowerment Initiative," (CIEI) and it is a practical implementation of Remer's proposed Low-Tech Vocational Education and Training (LTVET) methodology.

In addition to introducing and theoretically describing the CIEI's objectives and functions, I provide a discussion on its proposed pedagogy; key stakeholders; an adaption of the Capacity Factor Analysis as a teaching tool and an effectiveness measure; and metrics of success. I briefly examine three current NGOs that already operate in the same general problem space as the CIEI. Finally, I propose that the Southeast Asian nation of Cambodia is ideally suited to the concept of the CIEI. This paper does not present analytical results but instead a qualitative approach to simultaneously addressing infrastructure shortages and the plight of impoverished, marginalized youth around the globe.

Keywords:

Appropriate infrastructure, marginalized youth, developing nations, community development, water infrastructure, sanitation infrastructure, orphans

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1 Introduction

In this article, I am concerned with two global issues related to human well-being. The first deals with developing communities' lack of access to basic human services provided through infrastructure, e.g., access to sufficient quantity and quality of drinking water and sanitation services; we may call a community's ability, or lack thereof, to produce and sustain such infrastructure its "capacity." The second global issue is the plight of children and young adults who have no sustainable care system around them—such as is normally provided through parents or extended family: street children, unskilled and unemployed young adults from impoverished backgrounds, and youth with families unable to care for them because of death or poverty—all fit into this category. At the risk of oversimplification, I will refer generically to the young people caught in this plight as "orphans" throughout this article.

Globally, 780 million people lack access to clean water, and 2.5 billion lack access to adequate sanitation services. (UNESCO Water Corporation 2013, 2013) UNICEF reports that

132 million children in sub-Saharan Africa, Latin America, Asia, and the Caribbean have lost at least one parent, and 13 million globally have lost both. (UNICEF, 2015) Rather than view the global lack of sanitation and abundance of marginalized children and youth as two separate challenges facing the development community and the human race, in this paper I propose an approach for empowering disenfranchised youth in poor communities—communities as lack access to sufficient infrastructure—through engineering and technical education. The newly-empowered youth, in turn, increase their communities' infrastructure capacity and develop new, technologically appropriate water or sanitation systems which in turn benefit all members of the local community. This proposed approach, then, works on a micro-scale, benefiting the individual "orphans" who receive the training through providing improved employment prospects and purpose, and it works on a macro-scale to improve the lives of all community members. I term this approach the "Community Infrastructure and Empowerment Initiative." (CIEI)

1.1 Essential Human Services and Community Capacity Building

Before discussing the CIEI itself, a few notes on capacity building as related to it. The term "capacity building" is applicable in a variety of fields and is defined by the Catholic Relief Services as "an ongoing process through which individuals, groups, organizations and societies enhance their ability to identify and meet developmental challenges." (Catholic Relief Services, 2014) In the context of this paper and the CIEI, infrastructure capacity building is defined as the ability of a community—more specifically, the men, women, and children that make up that community—to design, develop, and maintain a technologically appropriate type of infrastructure necessary to meet the seven essential human services (EHS). Louis and Bouabid define these services, which are necessary for human life across the globe, as 1) breathable air, 2)

clean water, 3) food, 4) shelter, 5) sanitation, 6) household energy, and 7) personal security. (Louis & Bouabid, 2013)

Water and sanitation are among the most important and widely deficient of these services in developing communities. The World Economic Forum has listed water crises as the number one global risk, in terms of impact, facing Earth and her human inhabitants. (Cann, 2015) The United Nations University's report *Water for the World We Want* expounds on the global threat posed by water crises and states that, among other recommended steps, "**capacity development** must be nested within, and form a pillar of, institutional reform at all scales within a country, with an emphasis on transferable skills that can be used for sustainable development across all areas and goals."((Schuster-Wallace & Sandford, 2015), emphasis added)

Louis has pioneered the Capacity Factor Analysis (CFA) approach, which uses surveys and expert observation to numerically elicit a community's capacity for water and sanitation (WATSAN) infrastructure and then matches a technologically appropriate type of infrastructure to the community's needs, based on its capacity. (Louis, 2002) The CIEI concept adapts the community assessment and appropriate technology acquisition methods of the CFA to address the problem of building human capacity for appropriate solutions to the challenges of youth unemployment and inadequate access to essential human services in developing communities. The World Economic Forum and the UN's views on water shortages and capacity building, just mentioned, deal with macroscopic, global issues while the CFA and the CIEI are localized, community-based initiatives, a disconnect that I recognize. However, global society is comprised of myriad small communities; if life can be holistically improved in these small human settlements, humanity will benefit on the larger scale.

1.2 Application of Low-Tech Vocational Education and Training

In another place, I have argued for the need within the global development community for Low-Tech Vocational Education and Training (LTVET) as a subset of reemerging global interest in Technical and Vocational Education and Training (TVET) and standard vocational education and training (VET). (e.g., (McGrath, 2012) (Allais, 2012)) Whereas VET/TVET programs are often focused on providing high-tech skills geared towards a global economy, LTVET is focused more on providing skills useful for developing essential human services and is focused on local communities rather than developing an overarching approach towards national development. LTVET is defined as:

> …a generic, categorical approach to providing skills-based education—informed by ethical concerns for the well-being of fellow humans—for members of impoverished communities as lack access to the most fundamental forms of water, sanitation, and other infrastructure necessary for human survival and flourishing. LTVET imparts knowledge and skills to community members, empowering them to develop their own grass-roots infrastructural systems at appropriate technological levels and provides students with knowledge of resources available to them for developing these systems. (Remer J. S., 2016)

In this article, I present the CIEI as one potential, practical implementation of the LTVET ideology. If human development and flourishing are the overarching goals of development efforts, LTVET is a categorical ideology for meeting people's most basic, physiological needs, and the Community Infrastructure and Empowerment Initiative is a manifestation of the LTVET ideology. Some non-profit organizations are already employing ideologies similar to that of the CIEI, and I explore a couple of these organizations in Section Four. Their efforts provide contextualization for and proof-of-concept of the CIEI approach. I am not, in this article, presenting the ideas behind the CIEI as entirely novel but rather as assimilative of existing ideas,

casting them into a unified ideological framework, for the betterment of the poorest members of humanity.

2 Community Infrastructure and Empowerment Initiative

The plight of Cambodian street children, as described in the documentary *Small Voices* (Connell, 2008), along with a cognizance of the need for appropriate, accessible, sustainable community infrastructure for meeting basic physiological human needs, led to the conception of the CIEI. *Small Voices* explained how some of the children from locally-operating NGOs, providing housing and education for street children through primary and secondary education, would at some point outgrow the home and be at risk of ending up back on the street, isolated and without caretakers. The CIEI was conceived as a way of continuing to provide care and education to these youths through engineering and infrastructure development training while harnessing their potential to help their local community gain increased access to critical infrastructure systems. I originally termed the concept an "Engineering Orphanage" (EO), a name of I have foregone due to the misleading images of completely parentless, helpless little children stuck in orphanages it conjures.

In this section, I discuss the generic structure of the CIEI and its intended impact on both its students and their communities. As yet, no pilot programs or tests have been conducted on this idea—it is still purely theoretical and is meant to provide a conceptual framework for future initiatives with similar goals. This is not to say the idea is not grounded in realistic, real-world efforts already underway. Later I will explore some real-world initiatives, by NGOs, that provide a realistic context for the CIEI concept.

2.1 Theoretical Conceptualization

The CIEI is a program designed to partner with existing children's homes, whether state- or NGO-run, by taking in youth who are graduating from the homes and equipping them with engineering and infrastructure development training and skills. While the model may vary with implementation and may work with youth not coming exclusively from existing children's homes, the primary conceptualization of the CIEI is that it will partner with existing children's homes and carry on their mission, so to speak. The advantage to this approach—compared to working with uneducated future students—is that entrants to the CIEI will have some base degree of education and competency upon which can be added engineering training, and the youths skirt the possibility of being turned out to the street. Of course, who specifically attends the CIEI will vary with context and environment; it well could be that in certain situations, pupils come from a variety of backgrounds and sources.

The core assumption behind the CIEI is that training even a small number of local young adults in focused engineering and infrastructure development skills can boost the local or regional human capital necessary for implementing EHS infrastructure projects in developing nations. Furthermore, these infrastructure engineering trainees can be trained and certified in a shorter time than engineers with a traditional undergraduate degree, at a fraction of the cost, and right within their home communities. Thus they are on site and equipped to advocate for and contribute to EHS infrastructure projects in their communities. Sustained access to EHS through the availability of the necessary infrastructure is associated with higher household incomes, improved health, and other indicators of human development in a community (United Nations Development Program, 2013).

The CIEI would operate on both micro- and macroscopic levels. On a micro-scale, it would equip individual students with skills that allow them to secure higher-paying jobs than would likely be available to them otherwise; on a macro-scale, it would benefit whole communities by increasing their human capacity for developing and maintaining EHS infrastructure. Figure 1 graphically demonstrates the intended purpose of the CIEI. The diagram represents a highly simplified, generic model of a developing community divided into three classes: an impoverished sector, in which impoverished people live; a "middle class," in which teachers, taxi drivers, established store owners, and other similar individuals live; and a "professional class," which consists of doctors, lawyers, nurses, engineers, and other professionals. I have intentionally excluded and ignored the "upper class" of uber-wealthy

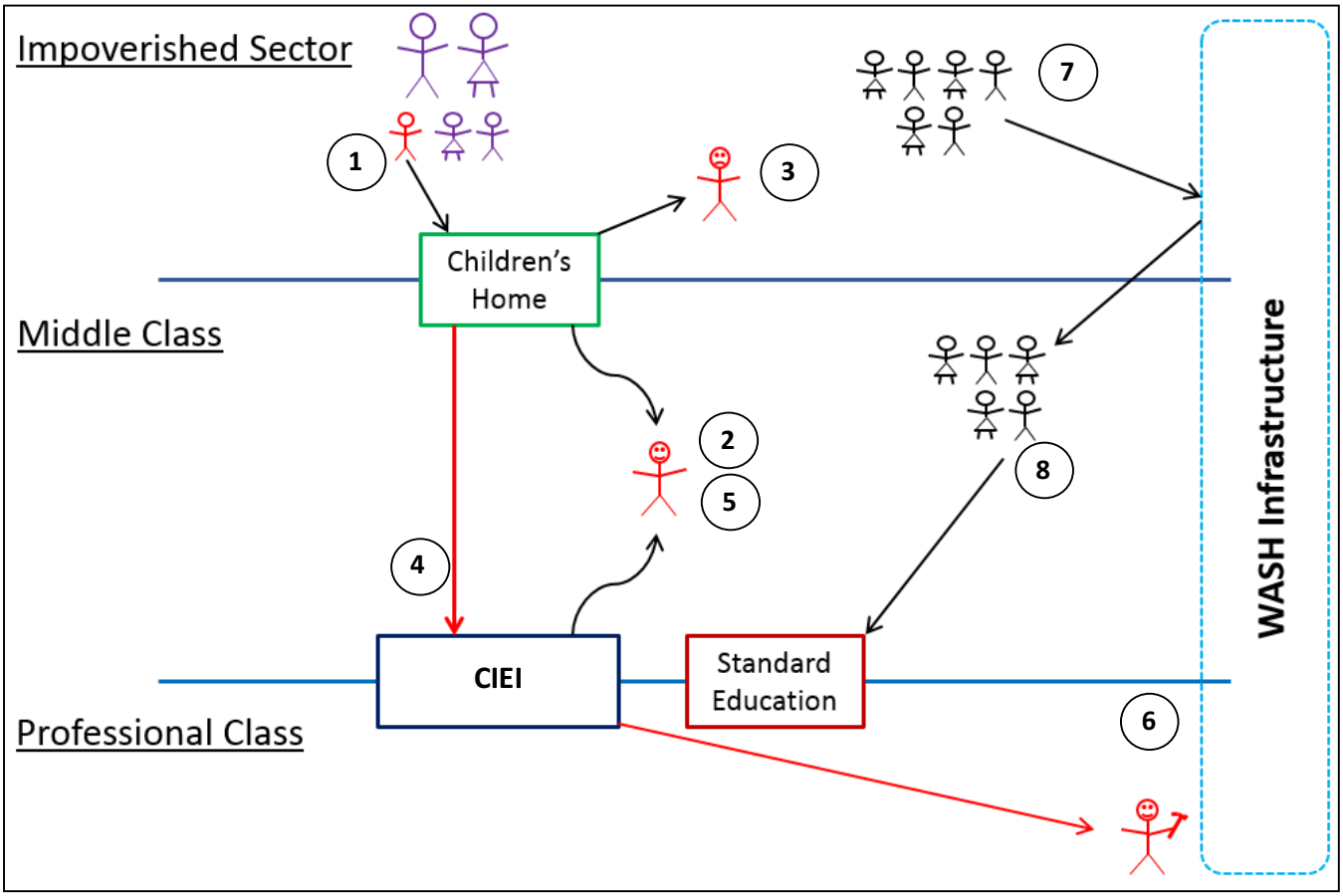

Figure 2: CIEI Conceptual Model

individuals in this model on the assumption that they receive education on the global market and are not directly involved in the daily lives of the impoverished members of their nations[7].

In step (1), an orphaned child, or a child whose family cannot support her or him, is sent to a children's home. This children's home trains the child, potentially empowering her or him to improve her station in life upon graduating and moving into the middle class (2), although there is always the possibility that s/he leaves the home and ends up back in the impoverished sector (3). The CIEI, though, is designed to reinforce and magnify the positive efforts of the children's home by accepting graduating students from the home (4). Upon completing the course of study, there is a chance that the student ignores the training and goes into a middle-class lifestyle (5), but the hope is that s/he completes the CIEI program and leaves with the tools necessary to develop water and sanitation infrastructure (6). This infrastructure spans across all class divides, but it especially benefits those in the impoverished sector, allowing them greater health and improved economic futures, providing them with the opportunity to move into the middle class (7). Once in the middle class, they can make use of existing standard education programs, such as local universities, to further improve their future prospects (8). Thus, the CIEI program benefits its individual students and the entire community.

2.2 Primary Objectives

As previously mentioned, the guiding objectives for the EO are twofold. The micro-goal is the empowerment of individual students, giving them a chance to capitalize on the education they have already received in their children's home, providing a place for them to live and learn

[7] This is not to say that the wealthy people in developing nations are categorically uninterested in the lives of their poorer countrymen—they may well be involved in aid or relief efforts, or in politics. However, their standard of living is considered to be similar to that of the hyper-wealthy in any other nation. They are thus exempted from this model and discussion, except for serving as potential benefactors and policymakers.

as they mature into early adulthood, and equipping them with community leadership and economic earning potential. The second, more macroscopic goal is the benefit of the community towards some degree of development through gaining improved access to essential infrastructure, providing for their essential physiological needs. A third goal, while not as relevant to this immediate discussion, is a global one: to replicate the ideology of the CIEI in multiple contexts around the globe to enhance human development in many communities and thus improve global society.

Regarding the first goal, the exact curriculum and plan of study for students at the CIEI are as yet unknown, as are the specific work programs in which graduates of the program will participate. These will depend heavily on the unique socioeconomic and cultural contexts in which the program is implemented. The program may function essentially as a trade-school, as a live-in community college that feeds into an established university's engineering program, or, someday, as a full-fledged university in its own right. The exact types of engineering taught, and how they are taught, will also vary with context depending on the needs of the local community, but they will have a unique focus on WATSAN technologies that are accessible to, both financially and technologically, and needed by that community.

Determining what technologies are "accessible" to a community will depend heavily on community leaders and supporting donors, as well as community members. Infrastructure is inherently a public good; just because a recent graduate has the skills necessary to develop it does not mean it will be developed. So, if the CIEI produces students with technical know-how to develop, say, a gravity-fed water system with bleach purification processes but the community has no interest in it, or no way to pay—financially and temporally—then the efforts of the CIEI

will be of marginal value. Thus, the CIEI by nature must be designed with the whole community, not only its students, in mind.

3 Practical Implementation

The Community Empowerment and Infrastructure Initiative is, at this point, a proposed implementation of Remer's LTVET methodology (Remer J. S., 2016), specifically geared towards development for impoverished communities lacking the necessary capacity for improved infrastructure. No direct pilot programs have been implemented yet and no study results are available for gauging the effectiveness of the initiative[8]; this paper serves as a conceptual introduction, and in this section I explore some of the most outstanding issues that would need to be addressed for such a program to be developed and tested.

3.1 Pedagogical Approach and Objectives

As the primary activity of the CIEI is to impart skills and abilities to students through teaching them, pedagogy is a critical leverage point in the CIEI system. The exact curriculum and plan for implementing the CIEI are as yet unspecified; they will depend heavily on the unique socioeconomic and cultural contexts in which the program is implemented. The CIEI may function essentially as a trade-school, as a live-in community college that feeds into an established university's engineering program, or, someday, as a full-fledged university in its own right. The exact types of engineering taught, and how they are taught, will also vary with context depending on the needs of the local community; they will have a unique focus on water and

[8] I mean that there are no direct studies of the effectiveness of the CIEI that can as of now be quantitatively reviewed. There are other initiatives similar to the CIEI already in operation. I introduce Agua Para La Vida, an NGO in Nicaragua, later in this paper as an example of a very similar program that provides education to impoverished rural students that is geared towards developing water systems for rural communities.

sanitation technologies that are accessible, both financially and technologically, to that community, but other forms of infrastructure development training—such as electrical systems (e.g., solar) or transportation—may be included.

I do not introduce a pedagogical outline or construct for the CIEI here, as it is beyond the scope of this introductory analysis. However, there are two aspects related to pedagogy to which future practitioners would do well to heed: 1) the necessity of ethics and leadership training in the CIEI curriculum, and 2) replication of existing programs elsewhere in the world. In a later section I discuss the potential usability of the Capacity Factor Analysis as a pedagogical tool.

3.1.1 Ethics and Leadership

Nelson Mandela said that "Education is the most powerful weapon which you can use to change the world," a statement that drives the development of the CIEI. However, technological education in and of itself presents no guarantee of a positive change [in] the world. One need not look further than the atrocities committed by highly-educated Nazi engineers to be convinced of this. Teddy Roosevelt said that "To educate a man in mind and not in morals is to educate a menace to society." With this in mind, the CIEI must place a specific focus on the ethical education of its students so that they truly become a force for positive change, not negative. Exactly how this ethics education will be accomplished is as yet unclear, but it will take into account local mores, beliefs, and convictions to remain culturally sensitive and relevant. It is clear that the CIEI must provide more than a purely "technical" education; technical skills are tools, but the wielders of such tools must be informed in how to use them. EF Schumacher in his seminal *Small Is Beautiful* argues that values—namely, metaphysical values—are absent from modern education and must be re-incorporated into our thoughts and curricula if we are to succeed in improving life for ourselves and those around us. "Education which fails to clarify our

central convictions is mere training or indulgence." (Schumacher, 1973, p. 107) If the CIEI aims to improve the lives of its students and the surrounding community members, its students must be given motivation to use their newfound skills and abilities not simply for their own self-interests.

3.1.2 Replication of Existing Programs

The CIEI is a streamlined concept for empowering rural and/or poor communities around the globe, but the ideology behind it is not entirely novel. Other individual initiatives similar in their goals and methodologies have been developed and implemented, and the CIEI would do well to replicate best practices from these other initiatives.

Agua Para La Vida (APLV), a registered French and American NGO working in Nicaragua, has been operating an educational program very similar in structure and objectives to the CIEI since 1996. *Escuela Tecnica de Agua Potable*, referred to as "ETAP," provides two years of intensive technical training, in engineering fields related to gravity-fed water system development, to high school graduates from impoverished, rural areas. Graduates from the program are certified "hydraulic technicians" who are then employed by APLV, other water-oriented NGOs, or local municipalities. The expertise of these students then becomes available to local, poor communities at a much lower price than from a traditionally-degreed engineer. Simultaneously, the graduates of the program have access to higher incomes than they would if they remained in their village as farmers or agricultural workers.

ETAP uses a full-time course of study for their students, who graduate as hydraulic technicians" after two years of intensive study. Prospective students are required to have earned a high school diploma for admission to ensure some baseline of competency (e.g., ability to read, write, and do basic mathematics), despite the poor quality of high school education in rural

Nicaraguan villages (Corcos, 2010). The ETAP course of study involves surveying and mapping, mathematics, technical communication, applied hydraulics, project management, computer usage, statics, and construction materials, among other topics. The course of study was designed by a PhD-degreed hydraulic engineer, and the courses are taught by a mixture of visiting international professors and the head of the school program. (Agua Para La Vida, 2010) Students spend approximately 60% of their 2-year program in classroom-based study and the other 40% working in the field with APLVs technicians.

A key aspect of ETAP's pedagogy is the use of computer programs to assist the students in their system designs:

> …while the young technicians-to-be will almost always remain slow at mathematical manipulations they are almost invariably adept at the use of computer programs so that the necessary bridge to that proficiency is the creation of special computer programs which, from the point of view of the user, short circuits involved mathematical or physical developments. (Corcos, 2010, p. 9)

APLV has developed two in-house, simple-to-use programs to assist the ETAP students in water system design and made the programs publically available. The educational model developed by ETAP, and in particular its usage of computers and technology, can serve as a basic outline for the CIEI's pedagogical approach. A deeper study of APLV's approach to education and how it can be replicated in global contexts should be conducted to provide a framework for use in the CIEI's pedagogical approach.

3.2 Stakeholder Considerations

As with nearly any large-scale program or initiative, identifying the affected stakeholders and designated decision makers is a question of the program's scope of application, as well as the primacy of each affected party and is a vital step to a thorough, systematic analysis. (Gibson,

Scherer, & Gibson, 2007) (Whitehead, Scherer, & Smith, 2014) Here I consider three forms of stakeholders related to the CIEI based on two different scales. The three stakeholder types are 1) primary stakeholders; 2) secondary stakeholders; and 3) primary decision makers. The two scales considered are i) local and ii) regional/global. The first considers a single, localized CIEI initiative implemented in no more than a couple of communities. Agua Para La Vida and its ETAP is an example of such an initiative—one program implemented in one location to serve a specific target community. The second scale deals with a global or regional approach to implementing the CIEI. On this scale, a centralized controlling body—perhaps an NGO, a governing body (or bodies), or large-scale aid organization—seeks to develop CIEIs in many different contexts for many different communities in pursuit of global or regional—not just local—development. While this broader approach will not lose any of the stakeholders considered in the smaller one, the impact of individuals and small groups of people will—or at least may—diminish and be eclipsed by the concerns of larger organizations; indeed, depending on the implemented scale, the entirety of humanity and our impact on the planet should be considered a stakeholder to some degree. Table 1 contains the various stakeholders and decision makers, broken into scope and primacy categories.

While claiming that the entire human population on Planet Earth should be considered as stakeholders may be considered an overstatement or an aggrandized out-scoping, this is not the case. From a static perspective, one may reasonably ask "How does changing the life of a group of street children in Cambodia impact my life?" especially if the questioner is, say, a rural farmer or shop owner in small-town America. However, when viewing the system from a dynamic perspective over time, it becomes clear that these two communities, and the individuals living in them, are connected. Perhaps the rural community aided by the CIEI opens a factory that

manufactures cheaper farming supplies than would otherwise be available, lowering prices for the farmer or shop owner. Or one of the CIEI students graduates and becomes a leader in an international organization, such as the UN, influencing policies that affect people across the globe. It is true that the connection between the American farmer and the CIEI student is neither immediate nor direct, but the aggregate of CIEI (and similar) initiatives may indeed impact the life of the farmer and his or her children in the future. Likewise, the farmer may have an impact on the CIEI students—perhaps he or she donates money to the program, or votes for a politician who supports (or opposes) global aid initiatives. That action, aggregated across all people like the farmer, may indeed have an impact on the life of a CIEI student. It is necessary to consider the macro-implications of aid efforts on global society due to their impact on the direction of humanity on this planet; readers are urged to develop a paradigm for global development so that our efforts crystalize towards a meaningful, valuable outcome for all people across the globe, not just those within the confines of individual aid initiatives. (ref. (Sen, 1999) (UNDP, 1990) (Remer J. S., 2016))

Table 1: CIEI Stakeholder Analysis

	i) Local Scale	***ii) Regional/Global Scale***
1. Primary Stakeholders	• Individual students • Local community members • CIEI Faculty and Staff • Local governing authorities • Potential employers (NGOs, governing bodies) • Local businesses • Existing children's home	• Regional and local governments and businesses • Enrolled students • Impoverished citizens • Faculty and staff • Localized NGOs or field offices carrying out CIEI efforts • Existing children's home organizations
2. Secondary Stakeholders	• Families of students • Local schools that feed into CIEI • Universities that may accept CIEI graduates • Neighboring communities	• Regional and global economy • Sovereign state governments • Members of governments (senators, representatives, governors, heads of state)

	• Academic observers • International parties (donors, observers) • Partner programs	• Large-scale aid organizations (United Nations, World Bank, etc)
3. Decision Makers	• Board of directors • Faculty and staff • Financial backers • Governing authorities	• Governing bodies and their constituent members • Voting populace (if applicable) • Board of directors • Global economy • Donors • Faculty and staff members

The purpose of Table 1 is not to exhaustively identify all parties involved in a CIEI, or any aid initiative for that matter, but to identify some of the largest categories of stakeholders and to show how they vary based on scope and scale of application.

3.3 Financial and Professional Support

It is well and good to build theoretical ideas about how a new program may positively impact the lives of the underprivileged, but at some point that idea requires financial backing to become a reality. Assuming that the CIEI starts not on a global scale but a local one, like many other non-profit efforts, it will most likely rely on donations and grants to initially fund its operations. However, the CIEI will be producing professionals with technical skills, or individuals well on their way to becoming professionals, in a region of the world that is set to rapidly expand economically in the coming years (Malik & al., 2013); these professionals may prove to be highly in demand by local or transnational corporations (TNCs). Because the CIEI would be providing a service—i.e., producing skilled technicians—TNCs may be willing to sponsor students in the program in agreement that the students work with the companies for a set amount of time afterwards. Such professional relationships may also provide internship opportunities for the CIEI students during their course of study.

A weakness in this approach to funding the CIEI, of course, is that it may draw students away from assisting their communities and into working on the regional or global market[9]. A potential way of circumventing this brain-drain, while still benefitting from the relationships with and financial support from TNCs would be to ensure that the students work in a local community on infrastructure projects for a set amount of time after completing the CIEI and before moving on to work for the TNC.

Other funding opportunities would be expected through standard NGO best practices, e.g., donations, benefactors, and public and private grants. Best practices for NGO transparency and open operation, while maintaining the dignity and privacy of students, must also be employed.

3.4 Adaption of the Capacity Factor Analysis

The Capacity Factor Analysis (CFA) pioneered by Garrick Louis and Ali Bouabid (Louis & Bouabid, 2013) (Louis, 2002) is designed for use in identifying appropriate water and sanitation (WATSAN) technologies for developing communities based on the human, natural, and technological resources available to a community. While it was designed independently of the CIEI, it provides a useful tool in helping accomplish the goals of the CIEI, namely serving as a pedagogical tool and as an evaluation tool.

[9] Working in the global economy is not, de facto, bad for the local community and would undoubtedly prove to be a boon in the long run, especially if the "global" market involves an ethically-run facility that provides jobs to others in the community. However, this paper is concerned with addressing short-to-mid-term well-being in the local community through improving infrastructure, and losing a student immediately after graduation would circumvent the community's benefitting from his or her training during this time frame.

3.4.1 Capacity Factor Analysis Overview

The CFA works in two primary steps. Initially, it gauges a community's capacity for infrastructure across various criteria; the community's capacity is given a numerical score between 0 and 100, with 0 being no capacity for infrastructure and 100 being perfect capacity able to support advanced technologies. The score is evaluated through a number of surveys and observations conducted by the CFA practitioner. Determining this score is the first step of the CFA.

In the second step, a form of WATSAN infrastructure appropriate to the community's capacity is recommended. This recommendation is drawn from a list of infrastructure technologies scored to reflect their appropriateness for different levels of capacity. For example, if a community has received a low capacity score of 24, then potential sanitation infrastructure systems that could be recommended include a septic tank with a drain field, soil aquifer treatment systems, or stabilization ponds. (Louis & Bouabid, 2013, p. 15) A higher capacity score would result in a more advanced form of technology, such as a reverse osmosis purifier or a centralized wastewater treatment plant. As the community develops technologically, socially, economically, and governmentally, so too will its capacity for improved infrastructure.

3.4.2 Application of the Capacity Factor Analysis to the CIEI

The CFA plays a dual role in relating to the CIEI. First, it provides a pedagogical tool, and, second, it provides a means of evaluating the success of the program after it has been operating for some time. Just as Agua Para La Vida's ETAP uses software as an integral part of its curriculum (Corcos, 2010), so could the CIEI utilize a computerized version of the CFA. This would provide the students with an ability to form a descriptive scenario of the state of infrastructure in whatever community they may be working. The CFA would have to be

transformed into an easily accessible, language-appropriate program for the students to utilize, but such adaptations are, while perhaps not easy, routine once the kernel of the program's purpose and operation exists.

Second, the CFA could be used for evaluating the success of the CIEI. The two broad goals of the CIEI are to 1) on a microscopic level, improve the lives and future prospects of individual students and their families through providing marketable training and skills; and 2) on a macroscopic level to improve the well-being of an impoverished community through providing knowledge and social momentum to improve access to infrastructure necessary for human flourishing in that community. The CFA is not especially useful in the microscopic category, but it would be useful for evaluating success criteria in the community category. Before any infrastructure project is undertaken in the community by the CIEI or any of its graduated students, the CFA should be used to find its capacity score. Some period of time later, after the infrastructure project has been completed, the CFA should again be employed, and the new capacity score should be compared to the old. If the new is higher than the old, then the community has developed. Clearly this metric will not serve sufficiently in isolation; there are many other external factors that could influence the community's growth and an increase in its CFA score, but it could at least provide one data point in evaluating the program's success.

3.5 Metrics of success

Properly measuring the impact of an initiative is crucial to successfully implementing positive changes to whatever system is being manipulated, including complex, human ones, and there is no simple, agreed-upon metric for gauging human success. During the years in which the neoliberal paradigm and Washington Consensus dominated development policy in the West, the simple metric for measuring state-level progress was Gross Domestic Product. (Gore, 2000) Now

we are using more complex, holistic metrics that reflect more humanistic concerns than just simple economic growth, such as outlined in the UN's Human Development Reports (Haq, 1995), based in Amartya Sen's conceptions of development being for human freedom. (Sen, 1989) (Sen, 1999)

Even the largest players get it wrong sometimes. The second UN Millennium Development goal was for the all children around the globe to be able to complete a full course of primary education by 2015. While it aims for all children to receive a primary education, it does not specify the quality of that education; unfortunately, in many cases, this translates to children sitting in their schoolhouses doing almost nothing while their teachers drink tea, talk to other teachers, and do not teach. (Banerjee & Duflo, 2011) In fact, some studies show that children who are not in school learn basic math skills better than their enrolled counterparts: "…all over the Third World, little boys and girls who help their parents in their family stall or store do much more complicated calculations [than children in school] all the time, without the help of pen and paper." (Banerjee & Duflo, 2011, p. 75) Thus, using incorrect metrics for success—children attending school even if they learn nothing while there—leads to undesirable outcomes.

There is hence no obvious single metric for gauging the success of the CIEI, and a close eye must be kept on the system's behavior as students leave the program. The two primary system goals are to, as stated in the previous section, improve the lives of the individual students and their families and increase infrastructure capacity for the surrounding community. For gauging student success, follow-up surveys eliciting information about health, employment, income, housing location, and general self-perceived well-being will be appropriate. These surveys should be conducted early in the years immediately following a student's graduation to

quantify short-term impacts but should also be conducted a number of years later to explore the long-term consequences or benefits of the program. The results of the surveys of CIEI students should be compared to a control group of students, who came from the same beginnings (perhaps the same orphanage or children's home) but took different routes than the CIEI. These comparative surveys will help to determine the effectiveness of the CIEI in the first of its goals.

The second goal is to improve community well-being through increasing its access to technologically appropriate infrastructure. Depending on the specific type of infrastructure needed by the community (e.g., water, sanitation, electrical, highway), the metrics will vary. If it is access to clean drinking water, perhaps one metric would be the decrease in number of miles walked each day by local women to fetch clean water. It could also be a measure in decrease of early childhood diarrhea (EDC), a leading cause of death in young children associated with unclean drinking water and inadequate sanitation practices throughout the developing world. (Bartram & Cairncross, 2010) Community surveys detailing percentages of the population who gained access to improved infrastructure through CIEI efforts are another. As discussed in the previous section, Louis and Bouabid's Capacity Factor Analysis may provide a systematic approach to gauging infrastructure in the community.

Measuring the success of the CIEI will be a dynamic initiative, needing to change as the community grows or new information becomes available. In order to elicit the impact of the CIEI itself and not just external growth and development in the community, it will be necessary to compare the infrastructural state of the community to other communities unaffected by the initiative. These control communities must be identified before the initiative even begins in the study community so that they can both be judged to have started from similar states.

4 Existing Models

In this section, I briefly review three NGO initiatives, each of which highlights a well-run organization that represents some component of, or is at least related to, the Community Infrastructure and Empowerment Initiative. I provide a brief introduction and description of each organization, a link to their websites, and an explanation of the relevance of each to the CIEI.

4.1 Cambodian Children's Fund

Website: www.cambodianchildrensfund.org

4.1.1 Overview and Introduction

The Cambodian Childrens Fund (CCF), founded by Hollywood Producer Scott Neeson in 2004, "transforms the country's most impoverished kids into tomorrow's leaders, by delivering education, family support and community development programs into the heart of Cambodia's most impoverished communities." (Cambodian Children's Fund, 2014) The program began when Neeson, on holiday in Cambodia, observed children digging through the notorious Steung Meanchey garbage dump, putting their lives and health at risk to eke out an existence for themselves and their families. In response to this observation, he left his Hollywood career and began CCF. CCF has grown from housing and educating 45 students to caring for more than 2,400 students in facilities across Phnom Penh. CCF's efforts with the students, their families, and the local community fall into 6 core categories: 1) Education; 2) Leadership; 3) Community Outreach; 4) Healthcare; 5) Childcare; and 6) Vocational Training, with education and leadership forming the guiding principle of the program. From their website:

> The two guiding pillars of CCF are Education and Leadership. The Education Program is the driving force behind CCFs operations, providing a pathway out of poverty for students and their families. The leadership program ensures that students graduate with a

> strong sense of social justice and a commitment to making a better future not just for themselves but for their community and their country. (Cambodian Children's Fund, 2014)

While CCF provides housing and education to its students, it functions differently from many other similar programs, which may be conceived of as traditional orphanages. Most of CCF's students are not orphans in any sense—they have surviving families with whom they are in regular contact. Their families may be unable to support the children, though; in some instances, CCF makes payments to the families to allow the students to attend school due to the family's lost income from that child. CCF functions to empower its students up to and beyond primary, secondary, and higher education. They also operate a vocational school focusing on non-professional skills. Recently, they have begun construction on the Neeson Cripps Academy, a STEM-focused facility that will provide its high school students with access to high-end STEM training.

4.1.2 Relevance to CIEI

As previously mentioned, CCF was instrumental in the conceptualization of the CIEI. In their earlier years, a CCF representative expressed concern about what would happen to their students after outgrowing the CCF program—would they outgrow the facility and end up back on the street, despite CCF's efforts?[10] (Connell, 2008) With this question in mind and in the problem space of the CIEI, CCF functioned as the theoretical "Children's Home" shown in Figure 1, a direct feeder of students into the CIEI. While CCF has developed many of their own post-secondary school programs for their students and are pursuing advanced STEM training,

[10] The author visited CCF in the summer of 2013. During a conversation with Scott Neeson, Neeson made it clear that this is no longer a concern and that none of the children would be turned out to the street after completing the program.

they have not developed a program similar to the CIEI. On a journey to CCF in 2013, the author spoke with CCF's career counselor who expressed immense interest in the CIEI.

Thus, CCF functions as an example of a primary stakeholder in the CIEI conceptualization, namely as a feeder of students who already hold some base degree of education and a disposition towards working in local communities. Other programs like it exist around the world, and wherever the CIEI were to first be implemented, it should find a program, or multiple programs similar to CCF with whom to partner.

4.2 Agua Para La Vida

Website: www.aplv.org

4.2.1 Introduction and Overview

I have already provided an introduction and summary of Agua Para La Vida and how they serve as a real-world model of the CIEI program in Section 3.1.2. APLV's *Escuela Tecnica de Agua Potable* (ETAP) is almost an exact, real-world, successfully operating model of how the CIEI should function—training local or regional students with knowledge to develop infrastructure, benefitting both the students themselves and the surrounding communities.

4.2.2 Relevance to CIEI

ETAP, as it currently operates, can almost be directly substituted into Figure 1 as the "CIEI" without the model losing any of its functionality. However, ETAP provides training only for gravity-fed water-system design; a vital skill in rural Nicaragua and in many other contexts around the globe, but one on which the CIEI would ideally expand if applied in a global context to include other forms of infrastructure development training. ETAP, then, is a sort of manifestation of CIEI ideology and a proof-of-concept.

One key lesson presented by ETAP and APLV is that ETAP, and by extension the CIEI, cannot operate in isolation from the surrounding community. Simply training students to develop water systems is not enough to actually build these systems; infrastructure is, generally, a public good used to serve entire communities. Even with know-how, developing such systems requires access to large amounts of labor and materials. Without access to these, ETAP and CIEI graduates would be useless to bring about change. However, APLV not only trains technicians but provides raw materials and works with communities to provide labor for installing and operating the systems. (Corcos, 2010) (Agua Para La Vida, 2010) This communal effort is often led by graduates from ETAP. Thus, for the CIEI to succeed in positively impacting local communities, it would need access to resources—human, financial, and otherwise—to mobilize surrounding communities to provide access to labor and raw infrastructure materials.

4.3 Focus: Hope

Website: www.focushope.edu

4.3.1 Introduction and Overview

Focus: Hope is an NGO, founded in 1968 by Father William Cunningham and Eleanor Josaitis, serving the Detroit region with the following mission statement:

> Recognizing the dignity and beauty of every person, we pledge intelligent and practical action to overcome racism, poverty, and injustice. And to build a metropolitan community where all people may live in freedom, harmony, trust, and affection. Black and white, yellow, brown and red from Detroit and its suburbs of every economic status, national origin, and religious persuasion we join in this covenant. (Foucs: Hope, 2015)

Through the years, Focus: Hope has worked to provide community resources and trade school opportunities to the surrounding Detroit area with a specific goal of non-discrimination and

peaceful coexistence. Through their career training efforts, nearly 12,000 people—both men and women—have established careers paying sustainable wages. (Focus: Hope, 2016)

4.3.1 Relevance to CIEI

Focus: Hope is not unique in providing access to trade school and community support for poor communities; myriad NGOs exist around the world with the same objectives. It does not focus on infrastructure development as a means to community empowerment, either, although its programs equip graduates with skills necessary for maintaining infrastructure. But there are two elements that particularly make Focus: Hope of interest to the CIEI. First, Focus: Hope is located in the United States, one of the wealthiest countries in the world, and yet it still serves to empower impoverished community members with marketable skills. This is of relevance to this current paper simply to serve as a reminder that the CIEI—or any aid initiative—is needed within developed nations as well as poor, rural third-world communities.

Second, Focus: Hope espouses and embodies diversity in its efforts, and the CIEI would do well to model itself after this approach. This will not be easy in many circumstances. For example, stigmas against street children, such as those trained by the Cambodian Children's Fund, may exist within their local context that may inhibit their involvement in future public projects. Further examination into how Focus: Hope, and other NGOs like it, practically implement diversity policies would be of benefit to the program.

5 Conclusion: Cambodia as Potential Implementation Site

The Community Infrastructure and Empowerment Initiative is a theoretical implementation of Low-Tech Vocational Education and Training meant to simultaneously empower individual youths and their surrounding communities by improving essential

infrastructure in these communities. It is drawn from real-world concepts and programs but is, as yet, an un-implemented construct. The purpose of this paper was to form a theoretical proposal of the system as a potential solution to the dual global crisis of disenfranchised youth and lack of access to reliable infrastructure, especially for water and sanitation.

In this final section I introduce Cambodia as a prime potential region for implementation of the CIEI. While Cambodia's eastern and western neighbors—Thailand and Vietnam, respectively—and the Southeast Asian region as a whole, have lurched forward into sustained economic growth in recent years, Cambodia has lingered, both economically[11] and in terms of human development. (The World Bank(b), 2016). The bloody reign of the Khmer Rouge in the 1970s, which resulted in the deaths of between 1.2 and 3.4 million Cambodians[12] (Heuveline, 1998); the tremors of the Khmer Rouge regime still echo in modern society, (Emond, 2009) but the nation is set to continue growing despite the setbacks facing it.

The CIEI could be uniquely useful in Cambodia for two primary reasons: 1) the national lack of infrastructure; and 2) an extremely high percentage of youth in the nation. According to World Bank estimates, 82% (12.2 million) of the population lacks access to piped water while 63% (9.3 million) lack access to improved sanitation. (The World Bank(a), 2016) The CIA Factbook reports nearly 50% of the population is below the age of 24, and a stunning 31% is below the age of 14. (Central Intelligence Agency, 2016)

Ruth Emond reports from a study of Cambodian orphans that they, the children enrolled in orphanages, typically view themselves in line with three general categories. (Emond, 2009)

[11] Cambodia is experiencing economic growth and is projected to continue growing, but not as quickly as the rest of the region. The nation is considered to have met the Millennium Development Goal of halving poverty, but only narrowly so. (The World Bank(a), 2016)

[12] The actual number of those killed under the regime of the Khmer Rouge, both directly through execution and indirectly through starvation, is the subject of intense scholarly debate. (de Walque, 2005)

First, they view themselves as "becoming," that is, growing into future individuals who will use their skills to make their world a better place for themselves; their primary mindset is invested in the future, not the here and now. Second, they see themselves as helpless. They are entirely dependent on their caretakers at the orphanage, thus their future largely depends on what is provided to them now through resources they cannot directly access. Third, they view themselves as lucky. This may strike Western audiences as odd at first—the thought of poor children sitting in an orphanage conjures pity from the average Western mind—but the orphans do not see it this way. According to Emond, they consider themselves lucky in comparison to their friends who live on the streets because they, while enrolled at the orphanage, have time and opportunity to study, food to eat, and a chance to prepare for the future.

The mindset of these orphans in Cambodia, the abundance of youth in the nation, and the national lack of infrastructure makes the CIEI seem like a good fit for addressing some of the threats to the nation. Of course, one cannot simply assume a program like the CIEI could be generically applied anywhere in the nation; it would have to be designed with specific communities in mind and with detailed and local knowledge of on-the-ground conditions and needs. This type of knowledge should be acquired through further study, research, and practical action. As is clear from the efforts of Agua Para La Vida in Nicaragua, the CIEI concept is not exclusive to Cambodia, and it is my hope that the model could be adapted to many contexts around the globe, even within the United States and other developed nations. However, Cambodia immediately presents a prime context in which the CIEI concept could develop.

In this paper, I have presented theoretical solutions to global, human issues. These ideas are based on real-world examples and are meant to address real-world problems holistically, compassionately, and effectively. But I have offered no data validating the approach, or proof-of-

concept beyond the success of similar existing programs. Much work remains to be done if the Community Infrastructure Empowerment initiative is to develop into a practical solution to poverty problems. Even if the concept never does develop into an applied program, I hope that the ideas presented here spur further, careful exploration and implementation of programs to both provide access to essential infrastructure and to provide for the futures of disenfranchised youth around the globe.

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4 Bribery and Its Ethical Implications for Aid Workers in the Developing World

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Abstract:

Bribery is a complicated, multi-dimensional issue. Upon first glance, most westerners would immediately condemn it as an underhanded, unfair means of gaining an advantage in a competitive or legal situation, and so it is in virtually every case in the westernized world. However, the issue becomes much more complicated in the international context, particularly in developing nations, where giving and accepting bribes is often normal and expected.

This paper serves to inform ethical decision-making in situations where the "right choice" is unclear with regards to bribery, primarily for individuals performing aid work in foreign countries with corrupt officials and police officers. In such contexts, a simple offering of food, money, or a small trinket may make the difference between a person being able to accomplish meaningful, life-changing work for the local populace or having that work significantly slowed at best and being thrown out of the country, robbed, or imprisoned in worse cases. The larger scale bribery issues in international business and the laws pertaining to them are also discussed.

Keywords: bribery, foreign aid, engineering ethics, developing world

Prologue:

This chapter is a copy of a paper of the same title published in *Science and Engineering Ethics*, of which I am sole author. For an official copy of the published journal paper, please contact me at scott.remer@gmail.com or find it from Springer's library.

At first blush, this chapter may seem somewhat off-topic in comparison with the other sections of my dissertation. In my first chapter, I develop a paradigm for global development and analyze the prevailing paradigms functioning in modern, global society. In the second I propose the concept of Low-Tech Vocational Education and Training (LTVET) as a novel approach to development, and in the third I theoretically explored the Community Infrastructure Empowerment Initiative as a practical implementation of the LTVET mindset. In this, my fourth chapter, I explore the ethical implications of bribery as it relates to aid work in the developing world—a much narrower topic with a distinct philosophical bent when compared to the previous sections.

Anyone who has conducted aid work in developing nations with high levels of corruption will know that bribes and "grease payments" often go a long way in helping one operate without unnecessary harassment from local officials. If someone were to implement the CIEI, it is highly likely they will encounter a situation in which paying a bribe would quickly facilitate the operation of the program. But would making such a payment be ethical and morally defensible? I address this question—although from a general aid project perspective and not specifically from a CIEI viewpoint—in this chapter. Thus, this chapter is related to the overall dissertation by providing a commentary on one problematic issue that may arise in implementing the ideas proposed in previous sections.

1 Introduction

Bribery is an issue that permeates virtually every level of society, ranging from individual, interpersonal interactions to international business deals to legal decisions to major

government policy decisions. It is no new challenge to mankind's morality, having existed as long as corrupt human beings have, and it will not be completely eradicated from society until greed and corruption are. Still, the westernized world we live in today has made tremendous progress in stifling corruption and bribery, at least in a broad sense, and we as an educated populace consider ourselves largely immune to bribery and its effects. We are good at spotting and condemning it. Consider, for example, a large, international business firm which we will call Company A. Company A, which is based in the U.S., wants to secure a contract for work in a foreign country and is bidding against stiff competition. Company A has invested much in preparing their bid for the job and does not want that investment to go to waste, so they secretly offer the contract officer at the foreign firm a substantial amount of money in the form of kickbacks to award them the job. Company A receives the contract and proceeds with the work, but later the bribe is discovered and both Company A and the foreign firm suffer public disgrace and legal consequences from both the American and foreign country's government. This is just, we would say, and rightly so. A bribe was offered and accepted, and this is wrong, so the briber and the bribee must pay the consequences. Cut and dry, simple answer.

However, bribery is not always so easy to condemn. Consider now an American doctor, Lily. Lily volunteers for a non-profit organization in a central African nation and is bringing medical supplies with her across the border from a neighboring country during a short-term aid trip. Because she is a foreigner, the border guards detain her and go through all of her cargo, sometimes keeping some of it for themselves, other times just delaying her for several hours. Lily is on a tight schedule and wants to help as many people as she can on her trip; she knows that for the equivalent of $20 she can pay the guards, get across the border quickly and without hassle, and start helping sick people. Would Lily be justified in bribing the border guard to

expedite her aid work? Many of us would say yes because she is trying to help other people and not seek her own benefit. She would be paying a bribe though, which was an action we condemned in the case of Company A. Maybe bribery as an action in itself is not always wrong but instead depends on its context?

The goal of this paper is to provide an in depth understanding of bribery and the ethical issues associated with it and then to provide an ethical justification for certain types of bribery in certain situations, primarily for aid workers in the developing world facing situations such as Lily's. In order to reach this justification, bribery is critically evaluated from the ethical viewpoints of utilitarianism and rights ethics. Utilitarianism finds bribery justifiable if it is used to serve the greatest good of the greatest number of people, and rights ethics finds it excusable if a bribe is being used to uphold human rights to the greatest extent possible. A brief discussion of bribery from a Kantian perspective follows, which condemns all acts of bribery as unethical due to a lack of universal applicability. However, Kantian ethics are not given as much weight in evaluating bribery for global development as are rights ethics and utilitarianism due to Kant's strict lack of allowance for ethical ambiguity.

This paper is structured to first define bribery and to explore it in both historical and modern contexts; this discussion may feel overly extended, but the author deems it is necessary to work through the varied and sometimes competing definitions of bribery presented in the existing body of literature to reach a cohesive, working understanding of the nature of bribery that can be applied throughout the remainder of the paper. After reaching this definition, the paper critiques bribery through the ethical theories of utilitarianism, rights ethics, and, to a lesser degree, Kantian ethics and then surveys the state of laws governing bribery for international businesses today. Finally, bribery as it applies to foreign aid workers is discussed and a brief

moral guide for decision making about bribery is presented; essentially, a bribe is found to be ethically justifiable, if not ethically ideal, when it is the least unethical of a set of unethical choices.

2 What is Bribery and Why Does It Matter?

If asked to define bribery, it is presumable that an average person would say something along the lines of "bribery is offering something to someone to do something for you that they probably shouldn't do." This is a fair definition in a general sense, but a technical definition of bribery is much more difficult to obtain. Bribery is a form of corruption, which is defined by the Merriam-Webster Dictionary as "impairment of integrity, virtue, or moral principle." (Merriam Webster, 2013) When a bribe is made and accepted—note that bribery is always a two-party action consisting of the briber, who offers the illicit payment, and the bribee, who accepts it with the intention of taking some form of action favorable to the briber—it brings about a conflict of interest in which the supposedly unbiased judgment of the bribee is influenced in a direction favorable to the briber. Essentially, bribery creates a conflict of interest. The bribe may or may not change the final decision made by the bribee, but an accepted bribe creates a situation in which it is impossible for a decision maker to remain entirely unbiased.

Section 2.1: Scholarly Definition of Bribery

The definition of bribery has been the subject of a fair amount of scholarly literature. Michael S. Pritchard begins his article "Bribery: The Concept" (Pritchard, 1998) not by offering a definition of bribery but by listing several examples of it and examining the "common denominator" between these scenarios. A few of these examples are: 1) a company trying to secure a sales contract with another corporation through offering the purchasing agent a substantial sum of money to award them the contract; 2) a construction company who, knowing

that the condominium apartments it recently constructed do not meet building code requirements, offers the inspector a large amount of money to ignore the code violations; and 3) a student who wants a better grade in his philosophy class and also happens to own a car wash offers his professor free carwashes for a year if the professor will increase the student's grade. Pritchard defines the common denominator between each situation through quoting Thomas Carson (Carson, 1992):

> [A]n individual (the briber) pays another individual (the bribee) something of value in exchange for the bribee's doing something that violates a special duty or special obligation that attaches to an office occupied, or a role or a practice participated in, by the bribee.

Carson's statement is the accepted and understood definition of bribery both in Pritchard's article and in this one. Some scholars, though, have accepted slightly different definitions. Martin and Schinzinger, for example, define bribery as "a substantial amount of money or goods offered beyond a stated business contract with the aim of winning an advantage in gaining or keeping the contract, and where the advantage is unfair or otherwise unethical," (Martin and Schinzinger, 2005) and they cite Pritchard's article as the source for this definition. The author of this paper finds Martin and Schinzingers' definition too strong, as it automatically condemns bribery as unethical without regard for the context in which the bribe was made and accepted. Additionally, Pritchard does not condemn bribery as unethical in all situations. In fact, he argues that bribery in and of itself may be morally neutral but that the motivations for and consequences of it are not; bribery is a morally-associated concept that will always require a justification, but it may be justifiable. (Pritchard, 1998) Thus, it seems that Martin and Schinzinger are misrepresenting the essence of Pritchard's article. The author notes that Martin and Schinzinger are speaking of bribery specifically in the context of a business contract and could thus be justified in their

statement; however, as this is the only statement they make regarding the ethics of bribery in their entire textbook, the author believes that they misrepresent the complexity of the issue.

2.2 Bribery throughout History

Bribery is nothing new to humanity. Ancient literature shows that, for as long as humanity has been writing laws and rules, we have been trying to deal with bribery. The Code of Hammurabi, written in the 18th century BC, states that a man who bears witness in a court case for grain or money given as a bribe will have to bear the penalty imposed by the case. The Old Testament of the Bible contains multiple references to bribery. The book of Exodus, written around 1400 BC, says in chapter 23, verse 8, that "…you shall take no bribe, for a bribe blinds the clear-sighted and subverts the cause of those who are in the right." (*English Standard Version,* 2010) The book of Proverbs, written sometime between 1000 and 600 BC, says "A gift in secret averts anger, and a concealed bribe, strong wrath." (*English Standard Version,* 2010) These verses serve to show that bribery is not only an ancient moral issue, but that it is a complex one. The verse in Exodus clearly seems to condemn bribery as a social practice, and yet Proverbs seems to be offering a justification for making a bribe, at least in a context in which it could be used to avert a case of "strong wrath."[13]

Bribery has developed along with the rest of mankind's feats and faults throughout the ages. In the 18th century, the American transcontinental railroad was constructed, connecting the east and west coasts of the young United States, but this construction was only accomplished through a series of scandals involving a large amount of bribery, among other unsavory actions (PBS, 2003). Recent cases in modern history have proven that bribery is still commonplace today in the highest levels of society. In 2008, Siemens AG, a major German engineering firm, was

[13] Alternatively, the latter verse may be interpreted as saying that a bribe wrongly conceals an unjust action from justifiable wrath from the proper authorities, thus further condemning it as evil.

caught offering $16 million in bribes to the Argentinian president in an attempt secure a contract for making identity cards. Many other major corporations have also been caught in the last ten years offering similar payments to secure international contracts (Mohr, 2012). Bribery has been with humanity ever since civilization began and does not seem to be going anywhere; we must learn to deal with it in an ethical fashion.

2.3 Bribery and Engineering Ethics

Why is bribery, along with all of its complexities and ethical implications, important to engineers? There are standard reasons that apply to engineers as to the rest of society, such as fairness and equality in competition, but there are others that make it of specific interest to engineers. Engineers are bound by a special obligation to first and foremost look to the safety and well-being of the public, as represented by the first canon of the National Society of Professional Engineer's code of ethics, which states that engineers shall "Hold paramount the safety, health, and welfare of the public." (NSPE, 2007) This means that engineers must be objective in developing and meeting safety standards for their projects without allowing conflicts of interests to divert their attention away from the safety of the public. Bribes could cause an engineer to compromise on the safety of his design and thus put the public at risk and cause that engineer to work against his fundamental ethical obligations.

On the other hand, what if the engineer is using his abilities in a developing nation where the only way to accomplish meaningful work, such as installing an appropriate water or sanitation system, is to bribe officials to allow him to transport his materials? In this case, he is bound to the welfare of the public, so making a bribe may even be considered his *duty* in upholding his code of ethics. Thus, it is vital for engineers to clearly understand bribery and the ethics surrounding it.

3 Ethical Dimensions of Bribery

Before discussing the specific ethical implications of bribery, let us take a moment to consider ethics as a general concept in its own right. "Ethics" are difficult to define and even more difficult to measure; while there may be general understandings of what constitutes "ethical" or "moral" behavior throughout most members of the human race, a concrete definition and set of metrics are elusive. Martin and Schinzinger define ethics as referring to "moral values that are sound, actions that are morally required (right) or morally permissible (all right), policies and laws that are desirable." (Martin and Schinzinger, 2005; p. 8) But who decides what is "desirable" or "right"? Are right and wrong, good and evil, naughty and nice defined by what a society says they are, or is there some outside Power that defines them for us, or is there simply no distinction between them at all? Why should we even care? These philosophical questions are the subjects of much debate and are beyond the scope of this paper, though the author encourages the reader to develop a personal conviction on how to define ethics and why they should matter. Despite the inherent difficulties in developing a philosophical foundation for ethics, a number of frameworks for evaluating the ethical implications of actions and decisions have been developed. These ethical theories provide a means of navigating through the tricky waters of what defines right and wrong, though whether an action is judged ethical or not often depends on the theory through which it is evaluated. Two of the most commonly accepted ethical theories are *utilitarianism* and *rights ethics*. Both will be briefly defined and then bribery will be analyzed from each viewpoint. Kantian ethics, a set of theories proposed by Immanuel Kant, will also be briefly discussed.

3.1 Utilitarianism, Rights Ethics, and Kantian Ethics

The theories of utilitarianism and rights ethics both have their primary roots in the Age of Enlightenment from the 17th and 18th centuries. Jeremy Bentham (1748-1832) and John Locke (1632-1704) are considered to be the primary developers of utilitarianism and rights ethics respectively (Vesilind and Gunn, 2005), though both theories have evolved into a series of sub-theories over time.

According to Vesilind and Gunn, Bentham is heavily credited for the development of *classical* utilitarianism, which foundationally argues that happiness in itself is the only true good in the world and that all actions should be judged right or wrong based on whether they increase the sum of human happiness in the aggregate. (Vesilind and Gunn, 2005; p. 22) Such a perspective requires knowledge of what makes not only oneself happy but what makes others happy as well. Essentially, classical utilitarianism is a giant cost-benefit analysis in which happiness afforded by one choice is weighed against happiness afforded by a different choice, only the analysis will always be incomplete because no single decision maker will ever have complete knowledge of the impacts of his or her decisions.

Utilitarianism has evolved from its roots into two primary forms (Martin and Schinzinger, 2005), which will be used for evaluating bribery. *Act utilitarianism* argues that every decision, no matter how small, is right if it "is likely to produce the most good for the most people in a given situation, compared to alternative choices that might be made" (p. 56) and is wrong otherwise. It is important to note that a decision is made based on what the *likelihood* of a good or bad outcome is; this is because no decision maker will ever be able to perfectly predict the outcome of her choices but must choose based on the knowledge available to her. Act utilitarianism places emphasis on the decision maker's judgment with very little regard for rules

or laws. *Rule utilitarianism*, on the other hand, states that "right actions are those required by rules that produce the most good for the most people." Rule utilitarianism places emphasis on laws that have supposedly been put in place that, when followed, bring about the greatest aggregate happiness. Strict adherence to this ethical framework would allow for no bending of the rules, even if lives depended on rules being broken. In a perfect world, both types of utilitarianism would work well: with perfect knowledge, a decision maker could always choose the action that would benefit the most people, and rule-makers could make laws that accounted for every difficult situation and so bring the most benefit to all. Alas, the world is not perfect, so each type of utilitarianism has strengths and weaknesses.

Rights ethics is a moral theory that was developed by John Locke. It is based on the idea that every human has intrinsic value and thus has a right to be respected regardless of social, political, or economic standing. Thomas Jefferson built on Locke's ideas when he famously stated "We hold that…all men are created equal; that they are endowed by their creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness." Based on a rights ethics perspective, a decision is ethical if it does not violate the inherent dignity—the rights—of an individual or a group. If a decision must be made that will violate people's rights, the morally "right" choice is the one that violates the rights of the smallest number of people.

Most people agree that humans have some level of "unalienable" rights, but it is difficult to clearly define what these rights actually are. What rights are we specifically entitled to? Can those rights be forfeited? Because of the difficulty in answering these questions, two forms of rights ethics have developed. *Negative rights*, also known as liberty rights or libertarianism, "are rights to exercise one's liberty, and they place duties on other people not to intervene with one's

freedom." (Martin and Schinzinger, 2005; p. 61) *Positive rights*, or welfare rights, are "rights to benefits needed for a decent human life, when one cannot earn those benefits…and when the community has them available." (Martin and Schinzinger, 2005; p. 61) Libertarianism states that an action is ethical if it does not intrude on another's privacy, and welfare rights state that an action is ethical if it provides for the needs of others to be met.

Immanuel Kant, a German philosopher of the 18th century, proposed a rigid set of ethical guidelines as a response to the "soft" or "wishy-washy" nature of utilitarian ethics that had grown popular in his day. A full summary of his views is not presented here, but the two foundational tenets of Kantian ethics are that 1) an action is ethical if and only if that action, conducted by a rational individual, could be replicated by all individuals in all of society without becoming a detriment to society, and 2) humans must always be treated as ends in and of themselves, never merely as means. (Gaskill, n.d.) The first tenet prohibits an action such as stealing in all circumstances, even if "stealing" a loaf of bread means the difference between the survival of one's own children or their deaths by starvation. This is because the action of stealing, if replicated across the entirety of humanity, would cause human suffering. No exceptions. The second tenet argues that an individual must never use another human being solely as a means but as an end in and of themselves. Another human may be used as a means, but only if they are consenting, with consent meaning that their wishes are respected and hence they are also being treated as an end. These are the fundamental, if heavily simplified, tenets of Kantian ethics. There are many other ethical theories that could be discussed here, and there are many more nuances to the theories already defined that display the strengths and weaknesses of utilitarian, rights, and Kantian ethical viewpoints. However, as the purpose of this paper is not to

serve as a critique of moral frameworks, the definitions already given for all three theories are sufficient for present purposes.

3.2 The Ethics of Bribery

This section addresses the general moral dimensions of bribery from the ethical theories just defined. From an act utilitarian perspective, it is very difficult to ever condemn any one single action as wrong; rather, an action is justified or condemned based on its context and its impact. Bribery is no exception. In most situations, a bribe is offered and accepted in order to give an unfair advantage to the briber and a certain amount of personal gain to the bribee. This may make both the briber and the bribee very happy, so one might argue that happiness is gained and so the bribe is justified. However, a holistic look at the situation would show that the impact of creating an uneven playing field in society through the bribe brings about a social level of unhappiness that far outweighs the happiness gained by the briber and bribee. Thus, such a bribe is unethical from an act utilitarian perspective. However, imagine a person being cruelly and unjustly held by a criminal organization who is able to bribe his guard into releasing him for some amount of money. It is true that such a bribe would cause the criminal organization much unhappiness, but the freed individual and society as a whole would rejoice that an innocent person did not suffer a cruel fate at the hands of criminals, and so more "happiness" would be brought about through bribing than without it. Such a bribe would be ethically justified under act utilitarianism.

Bribery is more difficult to justify under a rule utilitarian ethical code. If one adheres strictly to rule utilitarianism and there is a law or a rule banning bribery, then bribery is wrong under any circumstance, even in the case of the hostage being held by the criminals—although it is hard to imagine that anyone in their right mind would condemn offering a bribe in such a

situation. The only way that bribery could be justified under rule utilitarianism is if the rules made exceptions for bribes made in extreme circumstances. This would depend on the wisdom of the rule-makers and the rules to which one considered himself/herself subject. Thus, bribery can only be justified under strict rule utilitarianism if the rules themselves make exceptions for bribery.

The analysis of bribery from a rights ethics perspective is somewhat different than from a utilitarian standing. Libertarianism holds that bribery is, in general, unethical, but with a bit of a twist. Murray N. Rothbard, former dean of the Austrian School, argues that, contrary to the views held by many left-liberals, the bribee, not the briber, is the only party in a bribe who has the potential for an unethical action. In essence, the briber is simply offering a discount (through the bribe) that he would be happy to offer in any other context in order to secure a desired outcome. The bribee, however is in violation of his commitment to the party he represents by accepting the bribe and keeping the discount to himself—assuming that accepting the job from the briber would have been the best option even without the bribe—or by not securing the best possible outcome if the deal offered by the briber is sub-optimal (Rothbard, 1986). Thus, the briber violates no one's rights because he never forces any action upon anyone but simply pays what he would be willing to pay in any other context. The bribee, on the other hand violates the rights of his employer through not performing the job he/she has agreed to do.

From a more general rights ethics perspective, Scott Turow argues that there is a shared equality amongst human beings which demands equal valuation before the governing body, but bribery undermines this right to equality through unfairly advancing some individuals ahead of others. (Turow, 1985) Thus, bribery violates a human right and is unethical. He also argues that bribery is a crime against trust and undermines the faith of the public in their government and

leaders and is unethical because of this. Going further, Turow argues that if bribery is unethical within the American context, then it most surely is unethical in an international context, especially for a more developed country to make bribes in a less-developed one. He argues that excusing bribery in such a context can connote an imperialistic attitude in which the developed nation takes advantage of the less developed one. However, despite the general violation of human rights that occurs through bribery, Turow recognizes that there are some situations in which bribery may be necessary as the lesser of two evils. For example, if a prisoner in a Nazi concentration camp were able to bribe a guard to release him, that bribe would be justified.

Thus, from the ethical theories of utilitarianism and rights ethics, bribery is generally considered to be unethical and wrong, bringing about harm to the general welfare of the public. However, the theories do not agree in stating that bribery is *always* wrong, and much depends on the context in which the decision of whether to bribe or not to bribe is made. A general rule of thumb, then, for justifying or condemning bribery is to say that bribery is an evil that should be avoided, but it is a viable, justifiable action when it is the lesser of two or more evil options, and this is the perspective taken by this author. Kantian ethics, however, firmly and unequivocally condemn all instances of bribery in all contexts, as it is an action that is not ethically replicable on a societal scale. If a prisoner were allowed to bribe a Nazi guard to secure his own release through a bribe, then a corrupt corporation should also be allowed to make bribes to procure contracts they would otherwise never win. So, Kantian ethics disallow all instances of bribery.

4 International Bribery and the Foreign Corrupt Practices Act

It is worth briefly examining bribery and the laws that govern it on a macro, international scale before looking at the particular ethics of micro-scale bribery in foreign aid. In recent years, there has been a large push from westernized countries to abolish bribery from international

business, regardless of the nation in which that business is being conducted. This push has been largely successful, at least from a public perspective, but there is still really no way to know the status of secret bribery in international business today.

4.1 Historical Perception of International Bribery

For many years, bribery was considered to be a perfectly acceptable, if not ethically ideal, standard business practice for companies operating in foreign markets. (*The Economist*, 1999) The dominating philosophy could have been described as "when in Rome, do as the Romans;" that is, if bribery was a common catalyst for business transactions in the country in which business was being conducted, bribery should, or at least could, have been ethically used. Even today, in some cultures manners dictate that gifts must be exchanged between parties before any sort of business transaction can proceed, and drawing the line between "exchanging gifts" and bribery can be tricky. However, as international trade continued to develop and the disparity of wealth that bribery and corruption caused between the leaders of developing nations and their general populace became clear, the United States took action to fight international corruption by introducing the Foreign Corrupt Practices Act (FCPA), enacted in 1977. The law essentially mandated that American companies and companies that did business on United States soil could pay no bribes to any foreign government officials, and it was introduced to heavy criticism. The primary argument against it was that it put American firms at a disadvantage in the international market because the American firms could no longer effectively compete against international firms who were not subject to anti-bribery laws (US Department of Justice, 2012). This is slightly ironic, as the purpose of the law was, among other things, to create an even playing field for international business, but by limiting bribery the playing field was actually skewed in favor

of those not subject to the law. Nonetheless, the FCPA remained and now many other nations have followed suit and enacted similar regulations.

4.2 Overview of the FCPA

The FCPA, which is enforced by the United States Department of Justice (DOJ), was, according to a US DOJ handbook, introduced "in 1977 in response to revelations of widespread bribery of foreign officials by U.S. companies." The Act was intended to "halt those corrupt practices, create a level playing field for honest businesses, and restore public confidence in the integrity of the marketplace." (US DOJ, 2012) The law applies to and is enforced against American companies based in the United States and foreign-based companies that operate on U.S. soil. According to the DOJ handbook, the FCPA

> …prohibits offering to pay, paying, promising to pay, or authorizing payment of money or anything of value to a foreign official in order to influence any act or decision of the foreign official in his or her official capacity or to secure any other improper advantage in order to obtain or retain business (US DOJ, 2012).

The purpose of the law then is clear, and it is enforced through fines and prison time for serious offenders.

The FCPA prohibits bribery in a foreign context, but it is specifically designed to allow for certain exceptions. These exceptions are defined as extreme cases of extortion and "grease payments." Extortion occurs when one party demands payment from another and threatens harm to the other party if the payment is not made; basically, the bribee instigates the bribe and threatens to damage the briber if he/she does not pay. In a circumstance where physical harm or some other equivalent damage is threatened against an individual or corporation subject to the FCPA, the law allows for that payment to be made without any legal repercussions to the payer. "Grease payments" are payments made to foreign officials in order facilitate those officials in properly performing the jobs they should be performing anyway. Hence, a grease payment may

be made to a customs officer who is holding up a clean shipment of materials not because there is anything wrong with the shipment but because he wants payment. Thus, the FCPA allows for companies to make payments to protect themselves and their employees, assets, and operations. It just forbids the use of bribery as a means to unjustly procuring business.

4.3 International Fight against Bribery

The U.S. spearheaded the movement against international bribery with the FCPA, but other nations have now joined in the fight, and much progress has been made in eliminating high-level corporate bribes from the international marketplace. (Transparency International, 2012) For example, the United Kingdom recently introduced the Bribery Act 2010 which is virtually equivalent to the FCPA for British companies and companies that operate on British soil. It does not allow for the same provisions as the FCPA does for grease payments or payments made under extortion, specifically stating that "facilitation payments…are bribes" (UK Ministry of Justice, 2010) and that there are no exemptions for such payments in the Bribery Act. Other nations have taken or committed to taking similar action; at the 1997 Organization for Economic Co-operation and Development Anti-Bribery Convention, 39 countries committed to criminalizing foreign bribery. (Transparency International, 2012)

No small number of prosecutions has been carried out through the implementation of these laws, with 708 cases having been completed at the end of 2011 with 286 other cases still ongoing. The largest fine levied against any firm to date was $219 million against the American

JCG Corporation in 2011 for its participation in a scheme to bribe Nigerian officials to obtain contracts (Transparency International 2012; US DOJ 2011).

4.4 Impacts of Anti-Bribery Laws on NGOs and Large-Scale Foreign Aid

The FCPA, the Bribery Act, and other similar laws are primarily aimed at large for-profit international corporations, but they impact other groups as well. In particular, non-profit aid groups and non-government organizations (NGOs) are affected. These types of groups, hence referred to as just "NGOs," are trans-national, not-for-profit organizations that perform work and handle money in an international context, often competing with larger for-profit corporations for USAID and other government sources of funding (Helmer and Deming, 2011). NGOs are thus subject to the same anti-corruption laws as for-profit organizations, but those laws pose particular difficulty for them. Helmer and Deming outline some of these challenges in their report "Non-Governmental Organizations: Anticorruption Compliance Challenges and Risks." They discuss how NGOs often operate in developing nations and employ local natives to staff local offices. While this is often in line with the general goals of the NGO—providing a job and means of welfare to an otherwise impoverished person—it also puts the organization at risk because of the possibility that the worker is corruptible. If that employee is found to have taken corrupt action, such as offering a bribe, in the name of the NGO, even without the knowledge of the NGO's leadership, the entire organization could be subject to investigation and fines under the FCPA or other similar laws. Further compounding issues is the fact that a federal investigation, let alone a conviction or fine, into corruption in an NGO will have a much greater financial impact on the NGO than it would on a standard for-profit organization. This is because many NGOs depend on charitable donations to fund their operations, and allegations of corruption can significantly choke income donations, as most charitable donors do not want to be

associated with a corrupt organization. (Helmer and Deming, 2011) Thus, the FCPA and other laws pose a specific challenge to NGOs, and it seems that revisions of the laws to allow for the extreme circumstances faced by NGOs may be in order. However, most government officials do not seem particularly interested in prosecuting NGOs at this time, and it seems fairly unlikely that they will any time in the immediate future. (Helmer and Deming, 2011) Lawsuits against NGO's are possible, though, so individuals working with and especially managing within an NGO must be aware of anti-corruption laws and their implications for non-profit groups.

5 Micro-Level Bribery in Foreign Aid Work

This section finally addresses the ethical implications of a foreign aid worker making a bribe in a developing but corrupt nation. In such a context, there can be no question that paying a bribe can greatly expedite, or even make possible, relief work. An academic team from an undisclosed university regularly travels to an African nation to work on infrastructure problems, and upon arrival the leader of this team seeks out the local police chief and offers him a monetary payment to keep the corrupt officers from harassing the team during their stay, as long as the team is behaving legally. This payment saves thousands of dollars in terms of work time. Going back to the fictional case of Lily mentioned at the beginning of this paper, she would be able to bring her legal medical supplies across the border for a nominal fee if she would just offer a bribe to the guard. But are such actions ethical? If a foreign aid worker is faced with such a situation, what actions should he or she take?

5.1 Ethics of Micro-Level Bribery in Foreign Aid

It is difficult to provide a "cookie-cutter" answer as to whether bribery in foreign aid is justifiable or not, as the answer will truly depend on the context in which the bribe is made. On the one hand, small-scale bribes serve to entrench large-scale corruption, but on the other, they

allow for meaningful work to be accomplished by foreign aid workers for the good of the nation. Ultimately, a bribe paid by a capable, competent foreign aid worker to facilitate meaningful work in a developing nation is a justifiable action, even if it is not ideal. The work allowed by the bribe can help to build infrastructure, health care, or educational systems in the nation, meeting basic survival needs of the populace so that the nation can focus on fighting corruption in the future when they are not as concerned about where they will find their food and drinking water.

From an act utilitarian moral framework, this analysis makes sense: if making the bribe will benefit more people than not making it, then the bribe should be made and is justifiable. From a rule utilitarian viewpoint, the bribe is only ethical if it is legal, and this would depend on the laws governing in the particular situation; if the bribe were a "grease payment," then the FCPA would allow it and the bribe would be justifiable.

From a negative rights perspective, there is nothing unethical about the aid worker offering or paying the bribe; the only party capable of unethical action is the bribee who, if he or she was harassing the aid worker in the first place, was already acting unethically, so it is perfectly justifiable for the aid worker to make a bribe. From a positive rights viewpoint, the local populace has a right to have their basic human needs met, even if it requires violating the right to a fair transaction between the border guard and the aid worker, assuming the border guard is behaving "fairly" in the first place.

Thus, from all of these ethical theories, bribery by a foreign aid worker *can* be justified. Whether it actually is or not depends on the judgment of the aid worker based on the knowledge available to him or her. Asking whether or not the bribe will serve the greater good, or if it is the lesser of two (or more) evils, will serve in determining what the most ethical action is, and only good judgment and meaningful experience can help to answer that question correctly.

As previously mentioned, Kantian ethics always and under every circumstance forbid bribery, even if a single bribe could save many lives. However, Kant's philosophy is here dismissed as untenable, unrealistic, and potentially cruel—holding a moral imperative as more valuable than the lives of potentially suffering innocents is dangerous. This is not to say that the author believes Kant's ideas are evil or misguided—in fact replicability and treating humans as ends instead of means are goals towards which humanity should strive. They are simply infeasible in many parts of the globe if human flourishing is to occur. Upon reaching a certain level of "development," bribery should be outlawed, never to be replicated again, but our global society is not there yet.

It is worth noting that ethics often supersede laws, requiring that certain standards be upheld to a further extent than legally required. Conversely, it is possible that ethics require breaking a bad law. It could be that deciding to pay a bribe would technically be illegal, even if it is the most ethical action available. In such a situation, the briber would need to be aware of possible consequences and be willing to accept them.

5.2 Fighting Corruption While Still Trapped in It

Just because paying a bribe in a foreign aid context is ethically justifiable does not mean that it is a "good" action; it is still "evil," and is justified only because it is the least evil option available. Action should be taken to reduce corruption in developing nations, and true corruption should never be judged acceptable. There are numerous small actions that can be taken, such as paying no more for a bribe than necessary and training young children in the nation about the importance of honesty. One new movement that has gained traction in India and other nations such as Kenya is the use of anonymous bribe-reporting websites such as www.ipaidabribe.com. The website allows individuals to anonymously report petty bribes they had either paid or been

asked to pay. It has proven to be hugely popular and served to show the level of corruption in India; data from the website was used to push reform of the department of motor vehicle policies in Bangalore. Many similar websites are being developed around the globe, though funding is an issue for most of them. Currently, the websites serve primarily to show the level of corruption present in many nations, but it is hoped that they can discourage officials from demanding menial bribes in the future. (Strom, 2012) There is a need for innovation in fighting corruption and bribery in developing nations so that someday bribery will no longer be ethically justifiable in any circumstance because there are better options available.

6 Conclusion

Bribery is an ancient moral issue that has been prominent in society from the days of Hammurabi until now. It is ubiquitous, permeating society from the lowest to the highest levels, and different cultures attach different stigmas to it; some condemn it outright and others tolerate it. There is a high chance that individuals who practice international business or aid work will be exposed to corruption at some point and will have to make a decision as to whether to pay a bribe or not. Many international laws from multiple nations have been implemented and enforced to effectively combat bribery and corruption in international business transactions, but small scale corruption in developing nations is still pervasive.

The ethics of bribery are somewhat complicated in that, while it is generally condemned as unethical from most moral and ethical theories, it is condemned—or justified—for different reasons under different frameworks; libertarianism condemns it as a violation of the bribee's contract with his company, but act utilitarianism excuses it if it brings about the most happiness for the most people. While most theories condemn it as unethical, bribery can sometimes

provide a means of achieving a good goal that is otherwise unattainable. In these circumstances, bribery is justifiable, even if it is not preferable.

Let us return to the example of Lily that was introduced at the beginning of this paper. As a doctor on a short-term relief trip to central Africa, she is trying to bring legal, clean medical supplies across the border of two countries. She knows that if she pays a small bribe, she will be able to cross the border quickly and without disturbance, but if she does not she may lose several hours as well as some of her supplies and be less effective in helping the local residents. Should she pay the bribe? The answer is yes, she should. Paying the bribe may be unsavory, but it affords the most good to the most people. It is the least unethical option of an unethical set because of the corrupt nature of the country in which she finds herself. It is recommended that, for any aid worker who finds themselves in a similar situation, the worker ask themselves "Is paying this bribe the least evil option available to me in this circumstance, even if there are technically laws against it?" If the answer is yes, then the bribe should be paid, but if it is no, then it should not. Much interpretation of how to define the "least evil" option is left to the aid worker's experience and judgment. In the end, perhaps those two qualities are the most important assets available to a foreign aid worker faced with an ethical challenge, regardless of the actual nature of the dilemma: meaningful experience and good judgment.

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5. Conclusion: Global Development as an Exercise in Systems Thinking

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Abstract

The purpose of this, the final chapter of my dissertation, is to provide a high-level 'systems-thinking' overview of the preceding four chapters and to offer a final cautionary thought for human development as our technology continues to advance. This discussion is exclusive to my dissertation, meant not for publication but rather to serve as a sort of concluding lynchpin for my graduate studies. The preceding four chapters are mapped into a systems-thinking framework, using the twenty lexical components of systems thinking as metrics to show how, despite their qualitative nature, the chapters form a systems-thinking approach to combating global poverty. Using Meadows and Churchman's theories, a high-level stock-and-flow model of the Community Infrastructure and Empowerment Initiative is created and explained, mapping the concept into systems thinking terminology. I conclude by offering a final cautionary thought on the blind pursuit of human development as it coincides with technological progress in light of Aldous Huxley's dystopian *Brave New World*.

Keywords: Systems thinking, systems analysis, global development

1 Introduction

The purpose of this, the final chapter of my dissertation, is to provide a high-level 'systems-thinking' overview of the preceding four chapters and to offer a final cautionary thought for human development as our technology continues to increase. This discussion is exclusive to my dissertation, meant not for publication but rather to serve as a sort of concluding lynchpin for my graduate studies. It is no great stretch to state that this dissertation varies from most produced in systems engineering—it is almost entirely qualitative and works in the broad, ancient, and global problem space of poverty and the alleviation of human suffering. At times, it borders on the philosophical, asking questions about the meaning of what a "good life" is and whether bribery is ethical based on long traditions of ethical thought and discourse.

There are some engineers who may argue that this is, in fact, not an engineering dissertation; a lack of hard, technical analysis puts my work more in line with the humanities and public policy than any neo-traditional sense of 'engineering.' In response to this line of reasoning, I argue that we, as engineers, may then need to re-think our calling. I propose that engineers should be not purely technologists but rather mediators between technology and society. That is, we should primarily develop and employ technologies that holistically benefit human society rather than advance technology for its own sake, or for the sake of profit. Indeed, the first Fundamental Canon of the Engineer's Code of Ethics is that engineers shall "Hold paramount the safety, health, and welfare of the public." (National Society of Professional Engineers, 2016) In order to thus serve the public, engineers must be well versed in all constituent elements of "safety, health, and welfare" of the public, including society's social, ethical, economic, technical, and even philosophical needs.

The underlying objective and unifying theme of this dissertation is to explore how technology can be appropriately developed, accessed, and used by impoverished humans to improve their lives. Said differently, it is to explore the use of technology in the pursuit of human development. It is, then, squarely in line with the engineer's calling to "hold paramount" public well-being and, despite its non-technical nature, is fundamentally an "engineering" dissertation. If my work focuses more on the qualitative, "human" side of technology and engineering, then I believe it is justified according to the first segment of the Engineer's Canon. I encourage all fellow-engineers to consider the broader implications of their technical work from a societal perspective.

In the following sections, I discuss the themes I have covered in each chapter through a 'systems thinking' lens. In the first section, I use the 20 lexical components of systems thinking (Whitehead, Scherer, & Smith, 2014) to show how each chapter represents a piece of systems thinking for global development. In the next, I construct a high-level stock-and-flow diagram of the Community Infrastructure and Empowerment Initiative informed by Donella Meadow's approach to systems thinking and influenced by C. West Churchman's five principles of the systems approach. In the final section, I briefly provide a cautionary warning based on Aldous Huxley's *Brave New World* against the rampant over-implementation of technology in human development.

2 A Systems Thinking Approach

In this section, I present a definition of "systems thinking" and, using Peter Whitehead, William Scherer, and Michael Smith's 20 lexical components of system's thinking, I show how each previous chapter fits into systems thinking for human development. Like Whitehead,

Scherer, and Smith, I differentiate between "systems thinking" and a complete "systems analysis" and show how my work presents critical components of a systems analysis but not an entire analysis in and of itself.

2.1 Definition of Systems Thinking

Whitehead, Scherer, and Smith conduct a thorough literature review of the definitions and ideologies of systems thinking, the mindset that underlies (or at least, should underlie) all good systems analyses. Speaking generically, they state that "By thinking in systems, the practitioner considers the broadest possible aspects of a system with the goal of innovating change and focusing on optimal solutions that achieve the system objectives." (Whitehead, Scherer, & Smith, 2014, p. 2) That is, good systems thinking requires a holistic approach to manipulating elements within a set of interrelated components to achieve an optimal outcome based on the objectives of appropriate decision makers and stakeholders.[14]

The authors continue their exploration of systems thinking in context of systems modeling and analysis, making clear the necessity but also limitations of systems modeling using computational or technical methods—no model is complex enough to perfectly represent or predict reality, but some models provide useful insight. In the famous words of economist George Box, "Essentially, all models are wrong, but some are useful." (Box & Draper, 1987) Technical systems models are a piece, a critical piece, of systems thinking, but they do not present the entire picture. Thus, keeping a 'systems mindset' is crucial to any systems analysis.

[14] In any real-world, complex system there is no such thing as an "optimal" solution, but rather a set of tradeoffs between competing objectives, and a good systems analysis allows for these tradeoffs to be quantified and understood.

After exploring, comparing, and contrastring the ideologies of a variety of other authors on the definition of systems thinking, engineering, dynamics, and analysis—including C. West Churchman and Donella Meadows, whose work I will use in the next section—Whitehead, Scherer, and Smith define systems thinking as:

> *A thought process through which assumptions are examined about a set of interconnected elements that drive toward a common goal with the objective of discerning hidden values and evaluating evidence in order to assess conclusions.* (Whitehead, Scherer, & Smith, 2014, p. 5)

This is my accepted definition of systems thinking for this paper and for my dissertation in general, contextualized with this commenary from Churchman, which drives home the need for non-traditional, non-technical engineering mindsets to be integrated with systems thinking:

> *Accept the fact that 'application' is the biggest problem we face, compared to which population modeling, energy modeling, educational modeling are simple games. Start work on incorporating politics, morality, religion, aesthetics into the systems approach; do not believe the feeling types when they scream at your inhumanity nor the thinking types when they scorn your softness.* (Churchman, 1975)

These two statements provide the general mindset behind my dissertation.

2.2 Systems Thinking, Not Analysis

A complete systems analysis involves a significant number of steps, occurring both sequentially and simultaneously, leading from framing an initial problem to a final result. Put bluntly and needing so many qualifications that entire bodies of literature surround the concept, a complete systems analysis includes three steps: 1) problem definition; 2) problem solving; and 3) problem solution. The twenty components of systems thinking, as outlined in the next subsection, all fall somewhere into these three categories, or into all of them. For example, Number 2, "Descriptive Scenario," falls into the problem definition category, as it seeks to elicit

and represent current issues at play, and to identify the problem(s), in the current system. Number 7, "Iterate Analysis," may at first seem not to fit into the three steps, but in fact it is inherently built into the 'problem solution' step: the problem is not really solved if the proposed solution does not last or is not well-tested, so the third step requires that an iterative approach be taken to solving the problem. Number 17, "States of the System" is present in all three steps, providing insight into the operations and changes within the system. A complete, thorough systems analysis will involve the three steps—definition, solving, solution—mentioned, and these three steps will iteratively integrate all twenty components of systems thinking.

My dissertation, however, is not a complete, thorough systems analysis. My work addresses the concept of human well-being and poverty on global, regional, and local scales. Were it feasible to conduct a truly thorough, meaningful, objective systems analysis on global poverty and what it means for humans to flourish everywhere, there would no longer be a need for politics, argument, and war and we, humanity, would arrive in Utopia. Alas, modeling and thoroughly analyzing this global system is impossible, and forcefully implementing policies based on such analyses and theories—be they quantitative or qualitative—may lead to draconian results, as has happened historically.[15]

Even on a more localized level, say a generic community level on which a Community Infrastructure and Empowerment Initiative may be implemented, conducting a detailed, complete systems analysis—i.e., constructing a generic model of a developing community that lacks

[15] Attempts at forcing a single approach towards human flourishing have had disastrous results throughout history. Without going into the intricacies of 20th century communist regimes—in China, Russia, and Cambodia—and the potential corruption/power-hungriness present in the Heads of State—Stalin, Mao, and Pol Pot, respectively—it is clear that implementing a single, top-down, forced approach with a theoretical understanding of what will finally make society flourish—namely Communism in these nations—led to human rights atrocities and the untimely, unjust deaths of millions of people. Assuming that we, as a global society or subset thereof, have finally reached an understanding of what is required for human flourishing and forcing this idea on a populace is dangerous.

access to Essential Human Services and then providing recommendations from that model—would be infeasible due to heterogeneity between communities and the human complexities of each community. Such an effort may produce an interesting and formalized model that academics may laud, from our comfortable offices, labs, and conference rooms, as an interesting technical accomplishment. The outputs of the model, because they have the illusion of being "scientific," may be accepted by policy makers, and these recommendations may be implemented to the benefit of some. But without a specific context with regionally appropriate objectives in mind, it is impossible to conduct a complete systems analysis.

Recognizing this limitation, I have used my dissertation to provide generic, systems-thinking inspired conceptualizations about global development, specifically related to paradigms for human development, education that empowers communities with access to essential and appropriate technologies, and programs that provide this education. Given more time and sufficient funding, I hope to choose a specific context in which to test and implement the ideas I have developed. In this specific, defined context, I could make use of such risk and systems modeling tools as Pareto Optimal tradeoff curves; Hierarchical Holographic Modeling; and Risk Filtering, Ranking, and Management. (Haimes, 2004) However, in my work so far, I have forgone the use of these methodologies, as they require a more specified problem space than I yet have.

My dissertation does not represent a thorough, complete systems analysis. I do not provide a set of possible solutions for global poverty ranked against each other with quantified tradeoffs, and there are inputs to all of my theoretical models that remain unknown. In the next section, though, I explore how my dissertation is indeed deeply soaked in systems thinking and provides a basis for continued exploration of how to systematically combat poverty on a global scale.

2.3 Lexical Components of Systems Thinking

The twenty lexical components of systems thinking were proposed by Whitehead, Scherer, and Smith as a means for streamlining conversations and discussions on systems thinking to form a sort of common-tongue through which systems thinkers and analysts can clearly and consistently articulate ideas. (Whitehead, Scherer, & Smith, 2014) In addition to providing a lexicon for systematic communication, though, these components can be interpreted to serve as a checklist for a complete systems analysis.

The first column of Table 1 lists each of the twenty components[16]. In the subsequent columns, the importance or weight of each component to each chapter of the dissertation is marked. A bold "**X**" indicates that the chapter heavily focuses on ideas summarized by that respective component. Many components are present to some degree in each chapter—or could readily be integrated into it—but those not marked do not feature significantly in the specified chapter.

Table 1: Lexical Components of Dissertation

	Chapter 1:	**Chapter 2:**	**Chapter 3:**	**Chapter 4:**
Keyword:	*Paradigm*	*LTVET*	*CIEI*	*Bribery*
1. Axiological Components	**X**	--	--	**X**
2. Descriptive Scenario	--	X	--	--
3 Develop Alternatives	X	**X**	**X**	X

[16] For an in-depth definition of each component, the importance and difficulties associated with each one, and positive and negative examples of each component in practice, the reader is referred to Table 1 in Whitehead, Scherer, and Smith's paper. I will not repeat their work here.

4. Evaluate and Rank Alternatives	--	--	--	**X**
5. Indices of Performance	--	--	--	--
6. Interactions	--	X	--	X
7. Iterative Analysis	--	--	--	--
8. Leverage Points	--	**X**	**X**	--
9. Life cycle of system	--	--	--	X
10. Metrics	--	--	--	--
11. Normative Scenario	**X**	--	X	--
12. Objectives	--	--	X	--
13. Observer effects	--	--	--	--
14. Outscope	X	--	--	X
15. Recommendations	X	--	--	**X**
16. Scope of the Analysis	--	--	X	--
17. State of System	--	--	X	--
18. System Boundaries	--	--	X	--
19. System Stakeholders	--	--	**X**	--
20. Type of System	X	X	X	X

Chapter 1, *An Overview of Global Development: Paradigms, Confusion, and Progress*, deals with the high-level goals of global development and human flourishing. Thus, it is primarily concerned with axiological components—that is, non-tangible, value-based judgments made and held by stakeholders—and developing a normative scenario for human development. The chapter compares current alternative viewpoints of human development held by the development

community and provides a recommendation for a new paradigm of development. The chapter looks to outscope each of these alternatives in order to find their strengths and weaknesses.

Chapter 2, *Human Development Through Low-Tech Vocational Education and Training*: *Empowering the World's Most Vulnerable*, primarily develops an alternative approach to vocational training—namely Low-Tech Vocational Education and Training—through identifying a lack of such training as a critical leverage point for human development in impoverished communities. To a lesser degree, it explores the descriptive scenario of communities that lack access to essential human services and identifies interactions between these communities, programs designed to help them, and the global economy at large.

Chapter 3, *Building Community Capacity for Infrastructure Through Empowering Disadvantaged Youth*, is the most practical chapter in the dissertation and thus deals with the most lexical components. Like Chapter 2, developing alternatives and manipulating a leverage point—that is, empowering youth through technical education to simultaneously benefit themselves and their communities—features heavily, but in this chapter stakeholders and the scope of the analysis are also considerations. This chapter provides a model for moving from a descriptive scenario to a normative one and explores some of the goals necessary for this to occur. Because a systems model is constructed in this chapter, states of the system and system boundaries are also heavily featured.

Finally, Chapter 4, *Bribery and Its Ethical Implications for Aid Workers in the Developing World,* primarily develops, evaluates and qualitatively ranks alternative viewpoints on bribery and then makes a recommendation for how to proceed in some ethically dubious situations. It seeks to outscope one's approach to bribery based on how a bribe affects interactions between

members of a community, with the goal of phasing all acts of bribery out of practice over the lifecycle of a community's development.

Glaringly absent from any of the four chapters are *5. Indices of Performance*, *7. Iterative Analysis*, *10. Metrics*, and *13. Observer Effects*. The absence of metrics, indices of performance, and iterative analysis is the primary reason this dissertation is not a complete systems analysis. One the most critical components for successfully implementing change in a system is to set and measure tangible indices of performance, drawn from system metrics, that reflect the system's goals. I have largely ignored any attempt to define indices of performance or metrics in my work here in interest of instead developing a robust normative scenario with meaningful goals and sub-objectives. Further work on defining these metrics and indices must be conducted before the ideas I have presented here can be implemented. Once these metrics and indices have been identified, the ideas I have presented must be iteratively tested and refined, or perhaps even discarded and replaced. In any real-world implementation of the ideas in my dissertation, observer effects must be included, with the analyst being aware of his or her biases and personal objectives in human development.

The 20th lexical component, *Type of System*, has been marked as included in all four chapters, not due to its explicitly being addressed in each but because all of the chapters are dealing, in large part, with the same type of system, that is, a human system that integrates human physiological needs with ethics, morals, and sociological constructs.

3 High-Level Stock-and-Flow Diagram

Each different chapter of my dissertation represents a different system, or the chapters represent related systems but on different scales. The first is expansive and philosophical, the

second narrows, and the third presents a practical construct for implementing the ideas of the first and second. Were a specific context chosen in which to implement the Community Infrastructure and Empowerment Initiative (CIEI) as described in the third chapter, a complete systems analysis could be performed for the concept. Such a context has not yet been chosen, meaning that many goals and constraints are as yet unknown, but in this section I construct a theoretical stock-and-flow systems diagram of how the CIEI may operate, analyzing the model from the systems thinking perspectives of C. West Churchman and Donella Meadows.

C. West Churchman argues that a designer or analyst must consider five different aspects of any system on which he is working: 1) objectives and performance measures; 2) environment and fixed constraints; 3) resources; 4) components; and 5) management. (Churchman, 1975) With these five considerations in mind, I have developed a very high level stock-and-flow systems model with a number of balancing and reinforcing loops. (Meadows, 2008) This model, as seen in Figure 1, is meant to give a qualitative, not quantitative, understanding of how the CIEI system may operate in terms of its resources and student's abilities, which are the two "stocks" in the system. Because of the high-level, non-quantitative nature of this model, and due to its generic (i.e., not being designed for any specific context) nature, there are of course variables, objectives, and relationships between these variables and objectives that are not captured. Still, the model gives the reader a general idea of how the CIEI system may operate in a generic developing world context.

As noted in the previous section, most of my analysis in this dissertation has entirely ignored system metrics and indices of performance. In an attempt to address this, in the following section I provide simple examples of potential indices of performance for the CIEI in each of Churchman's five categories.

The model shown in Figure 1 consists of two boxes, "Student Potential" and "CIEI Resources," that represent the stocks of the system and a series of nodes that represent various system variables, states, and objectives. The arrows between the boxes and nodes show the ways in which the different components relate to each other. The "spigots" on both sides of the stocks represent the paths through which the stocks are increased or decreased: an arrow flowing into the spigot to the left of the stock shows that the stock is increased, and an arrow to the right-hand spigot shows that the stock is being decreased. The clouds represent system boundaries, specifically where exactly the system resources come from and where they go. Arrows in red represent balancing loops, marked with a "B" and green arrows represent reinforcing loops, marked with an "R." Blue arrows form elements of both reinforcing and balancing loops or just represent a relationship between one variable and another.

3.1 CIEI Model Introduction

Churchman's five systems considerations, as they relate to my CIEI model, are here discussed, along with a stakeholder analysis for each component. Because of the high-level nature of the model, not all metrics or variables are immediately commensurate with one another, and the stocks and variables all represent a variety of individual real-world components. For example, the stock "CIEI Resources" includes all factors that empower the initiative to operate, including funding, staffing, facilities, available technology, and even relationships with local stakeholders. Obviously, "relationships" cannot be directly added to "funding" to find the total value of these categories. Separate, individual CIEI funding models could of course be developed that would allow for more quantitative analysis, but that is not the intention of this qualitative model.

3.1.1 Note on Stakeholder Analysis

Before describing the specific pieces of the model, it is worth making a quick note about stakeholders in development work. I have already discussed this in the previous chapters, but it bears repeating here. Unlike in the for-profit consulting field, it is very difficult to identify a single client or decision maker in aid and development work—is it the people who are sponsoring the development work, the beneficiaries of the aid work, or the government of the country being helped? This confusion regarding who the "client" actually is has even been used by some to argue that aid work is counterproductive. (Prokopijevic, 2007) Nonetheless, in every project "There is always a client" (Gibson, Scherer, & Gibson, 2007) and a decision maker.
In the context of the CIEI program then, it seems most likely that all stakeholders are actually clients and decision makers to some degree or another; everyone wants the lives of the poor to be improved, granted some desire this more than others—some are just greedy for personal gain. In some circumstances it may be very clear who the specific client or decision maker of a specific task is, but on the high-level scale of the CIEI project being discussed right now, there is not one specific set of identifiable clients. Still, the overarching goal of the CIEI program is to benefit the lives of individual young adults and their surrounding community, so these two groups are considered the "clients" for the rest of this discussion. However, they are not the decision makers—that task falls on a variety of other parties, such as the groups that decide whether to fund the project, the teachers who decide whether they will teach at the CIEI, and the government officials who decide whether to allow the program or not. I, as the designer of the CIEI program, am also a decision maker. Other stakeholders are identified in the following discussion of the model components.

3.2 CIEI Model Through Churchman's Five Components

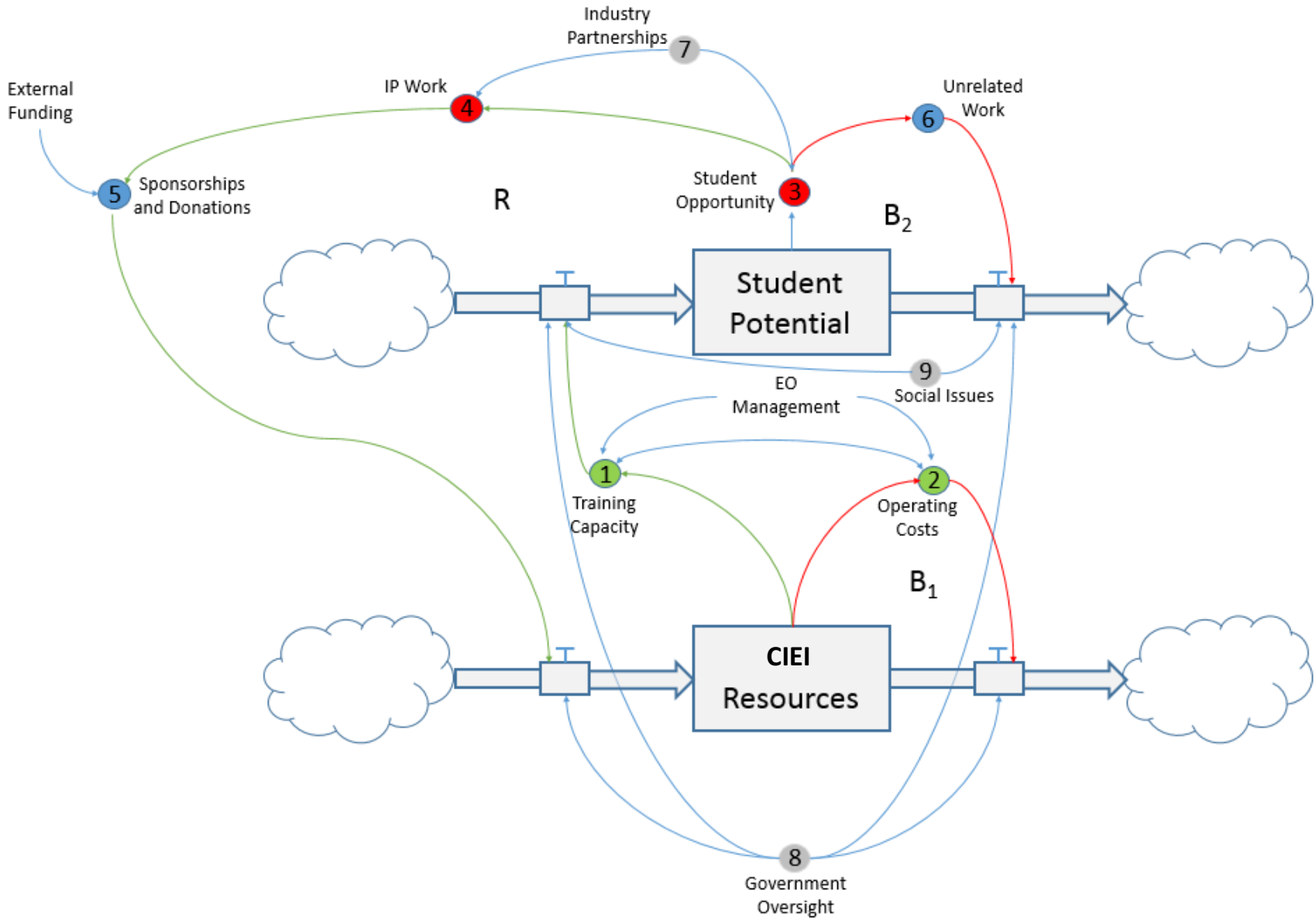
i) System Objectives and Performance Measures:

There are two overarching goals for the Community Infrastructure and Empowerment Initiative. The first is a micro-level goal, to improve the lives and futures of the young adults who come through the program. The second goal, the macro-goal, is for the students who have gone through the CIEI program to improve the lives of the people in their surrounding community through improving engineering infrastructure and through becoming leaders who can help shape community development.

These two objectives are shown in the model as red nodes 3 and 4. Node 3, "Student Opportunity," represents the micro-goal, and the model aims to maximize this value. There are a host of different metrics that could be used to quantify this success, such as students' test grades, the number of students put through the program, career and further educational opportunities open to them, student happiness X-years after graduation, student income, and so on. This node is directly impacted by the stock of Student Ability discussed below; an increase in the Student Ability resource increases Student Opportunity. Stakeholders specifically related to this node are the teachers of the CIEI program, universities where the students may further their education, local companies and businesses, and obviously the students themselves and their families.

Node 4, "IP Work," which stands for "Infrastructure and Policy Work" represents the positive impact students are having on their society, not just their own lives. The CIEI model is also aimed to maximize this, which is dependent on the level of Student Opportunity in Node 3. Metrics of success for this goal range could range from numbers of students who went into the IP field to the number/type of infrastructure systems developed for impoverished communities by the students.

Figure 3: High-Level CIEI Stock-and-Flow Model



ii) Environment and Fixed Constraints

This category represents the context in which the CIEI would operate but does not have the power to change or control. Of course, it is possible that some of these factors could be influenced by the CIEI and its management, but by and large they are not under its direct control. Gray nodes 7, 8, and 9 fall in this category. Node 7, Industry Partnerships, represents businesses and individuals who want to work with and support the CIEI and its students through providing job and volunteer opportunities, as well as funding, specifically for the students. Industry partnerships have the ability to directly influence Student Opportunity and students' success in IP Work.

Node 8, Government Oversight, represents local authorities who can impact the operation of the CIEI. Government involvement can, in reality, dictate or impact almost every element of this model, but it is assumed here that it has the most direct impact on the CIEI's ability to gain or lose resources or build or lose student potential. It is possible that the government may be able to provide tangible benefit to the CIEI, so Node 8 feeds into to the inflow spigot of each stock. However, it seems very likely that, due to the corrupt nature of many authorities in the developing world, the authorities may also hassle the CIEI and force them to pay bribes or may discourage the potential of students, so Node 8 also connects to the outflow spigots of each resource.

Node 9, Social Issues, does not necessarily relate to any single individual stakeholder and may not even be measurable, but it can absolutely impact the state of a society and, hence, the CIEI operating there. These issues might be political upheaval, a social rights movement, a set of religious beliefs, or even memories of a painful past. For example, in Cambodia, the Khmer Rouge genocide killed nearly one in four Cambodians, and that quarter consisted mostly of the

educated population. A culture cannot recover immediately from such an atrocity, especially when there are still survivors living who experienced it. The scars of the Khmer Rouge remain in the Cambodian populace, and this could absolutely affect the potential work of a CIEI there. Node 9 connects to the inflow and outflow points of the Student Potential stock, because different social events could have various impacts, either good or bad, on the student body.

iii) Resources

The resources in the model, or the "stocks," are two of the most key components of the model and should possibly have been discussed first. They are "CIEI Resources" and "Student Potential." As explained earlier, each of these contain a variety of non-commensurable categories that enable the CIEI to do its job and accomplish its goals. Both stocks are simultaneously dependent on each other; an increase in CIEI Resources can lead to an increase in Student Potential, which in turn can lead to more inflow to CIEI Resources, forming a positive feedback loop between the two stocks.

CIEI Resources includes all the elements necessary to enable the CIEI system to operate. This includes the budget, staff, facility, available technology, and relationships that the CIEI has available for doing its job. The "amount" of stock available in CIEI resources is not just meant to capture quantities of teachers or computers, either, but is also meant to represent the quality of all of the elements. Stakeholders with specific interests in this component will be donors, governments and aid agencies, staff, CIEI management, and the students themselves.
Student Potential represents the actual abilities of the student body to accomplish the tasks of having a better future for themselves and improving the lives of the community around them. This stock can be "measured" in the three general categories of the number of students enrolled, the skill of the students, and the students' motivation. Keeping track of the number of students is

simple, as it is just a simple number. Tracking the skill of the students is a little bit trickier but is still measurable through job placements, standardized test scores, and other similar metrics used at other educational institutions around the world.

Student motivation is much harder to measure and is arguably much more important than either of the other metrics. I propose it as a metric to address Schumacher's statement that "it is our central convictions that are in disorder, and, as long as the present anti-metaphysical temper persists, the disorder will grow worse." (Schumacher, 1973) The goal of the Community Infrastructure and Empowerment Initiative program is not just to equip youth with skills and opportunities, but to motivate the students to do good with them. Too many people go through life without actually asking what their purpose is, why they do what they do, thinking that this physical world is all that exists. Such a mindset leads to confusion or apathy at best and insanity at worst. The CIEI program will be designed to encourage students to think about the metaphysical reasons for their actions and desires and then turn those desires into good for themselves and others. Whether this motivation will come through some form of religious philosophy or some other source has yet to be seen and will vary on context, but it is vitally important to the mission of the CIEI.

iv) Components

When Churchman references "components," he means the actual elements of the model that make it work, distinct from its goals, resources, and environment. The distinction between "components" and the other elements in my model is not so clear, as they all fit together to form an extremely high-level model of a complex system of systems. So here I will discuss those system "components" that have not already been addressed and that do not represent the goals of

the system or the elements outside of its control. These are green Nodes 1 and 2 and blue Nodes 5 and 6.

Node 1, Training Capacity, and Node 2, Operating Costs, are considered to be the most controllable variables in the system by the CIEI system management, although they are highly dependent on the stock in CIEI Resources and other factors. They are also linked one to another to show the trade-off relationship between them: an increase in spending will also likely increase the training capacity, but at the risk of draining the stock of resources. Training Capacity represents how well the CIEI Resources can be used to increase student potential. One could even consider this node to be a sub-item of the CIEI Resources stock, but it is shown explicitly to make clear that it can be directed through careful management. Examples of Training Capacity might include the effectiveness of teachers, or opportunities the CIEI can provide to students for out-of-the-classroom training, among other things. Stakeholders here are, as always, the students and CIEI staff. The CIEI management is also particularly involved here, as this is the point through which it efficiently manages its resources.

Node 2, Operating Costs, is exactly what it sounds like. It represents the resources that must be paid from the CIEI Resources stock to make the system operate. The most obvious costs are financial: paying rent, taxes, bribes (if necessary), salaries, food costs, electricity, and the list goes on. However, there may be other costs that also affect the CIEI's ability to function. Management is shown as having input to it because management can decide how to efficiently use its resources.

Node 5, Sponsorships and Donations, is not directly controllable by the CIEI management, but neither is it out of the management's reach. It is highly dependent on the performance of the system and its students—if the students are successful, then funding to the CIEI will hopefully

increase. This funding could come in a variety of ways. Donations and grants are the most obvious immediate sources of income, but if the CIEI is successful in producing students that perform valuable work, private companies interested in hiring local engineers may be interested in sponsoring students to go through the CIEI program. Note the arrow marked as "External Funding." This is intended to show that an initial amount of funding not generated by any results of the CIEI system will be necessary to set up the initial system. Node 5 connects to the inflow of the CIEI Resources stock. Stakeholders in this node specifically include donors and funders, as well as grant-awarding charities and government programs.

Node 6, "Unrelated Work," shows the fields that CIEI students can go into after they complete the program that have little to do with helping the CIEI system meet its macro-goal. This could include students who leave the country, never to return, or who work a private industry job not related to policy or infrastructure development. While the goals of the CIEI model are definitely not to maximize this, they are not necessarily to minimize it either. It is of course hoped that students will choose to help their local society with their newly gained abilities, but if they choose to use them somewhere else, that is their choice and will not be counted as a system failure. Still, if all students begin going through Node 6 instead of Node 4, the system may have to rethink its method of training or redefine its goals. Node 6 is shown as negatively affecting the Student Potential resource not because it is seen as failure, but because it does draw away from the stated goals of the CIEI system and could encourage students who have not left the system yet to do the same.

v) Management

CIEI management is shown in the diagram, in the center, feeding into Nodes 1 and 2 as previously described. This is not meant to imply that management's only role is to oversee these

two elements, though, as it also has control of the purpose of the system and can influence other areas, such as Nodes 5 and 6.

Management is not shown as a node or any other element of the system because, while it is a part of the system, management must constantly monitor the entire system from above to evaluate whether it is achieving its goals and, if the system is not, management must decide where changes need to be made, using what Meadows refers to as "leverage points." (Meadows, 2008) The high-level CIEI model being discussed here may prove useful to management in terms of helping to identify general areas where leverage points might be, and what holistic effects individual actions might have on the entire system, but it will not help in identifying specific leverage points. For that, in-depth knowledge of the individual systems that make up the larger system-of-systems being discussed is necessary.

3.3 Conclusion

I have not provided a formulaic approach to solving poverty in any of these five chapters. Rather, I have sought to ask questions and provide frameworks for answers to these questions based on real-world efforts and ideologies. I have, while not always explicitly, used a systems thinking approach throughout this effort in hopes of making my work approachable, applicable, and foundational. I conclude my dissertation with a final warning for all of us in the global development field.

4 A Concluding Caution: A Brave New World?

As a student of the international development field, I have long been perplexed by what the final goal of global development is, and what potential dangers are associated with accomplishing it. I addressed this issue in my first chapter by developing a paradigm for human

development, but I wish to return to it once more here to address it from a slightly different perspective. There is little doubt that the intentions of most people in the field are benevolent and that much good has been accomplished for millions of people through large and small aid organizations, ranging from the World Bank and United Nations all the way down to the local community soup kitchen. Despite the positives of such efforts, though, a danger to humanity may lurk, even in our most benevolently motivated efforts.

It seems that the goals of international development are of a two-fold nature: on the one hand, we ultimately desire that all human needs be met for all people so that we all may have a healthy, high quality of life with all physical needs met. At the same time, we want to empower individual freedom and democracy in societies where these qualities are lacking. These two goals are not immediately commensurate, though they do not have to be mutually exclusive, either. Still, there is some tradeoff between the safety and security offered by the first and the freedoms afforded by the second.

If the goal of global development is meeting the human needs of all people, then perhaps a large nation or conglomeration of nations, e.g., the United Nations or the World Bank, should take over "needy" societies and force a top-down, state-wide restructuring, at the cost of the individual nations' freedoms. True, this might just be colonization all over again, which did not perfectly sort things out for the developing nations the first time—to say the least—but this time around we have better technologies and better ideas on what "fair treatment" is; it might actually work. Besides, like a parent for her child, do not we—the educated, wealthy, and enlightened members of the earth—often know best how to empower these developing nations, or at least know what's best to make them happy? Said more approachably, are not those of us who are enlightened best suited to enlightening those who are still in figurative darkness? Amartya Sen's

rebuttal of utilitarianism as an approach to development seems to support this view, however indirectly. (Sen, 1989) Of course, no one today would actually take the approach of dominating another society to "develop" it, or at least not knowingly. The development community is well aware of our shortcomings in our field, and we are constantly trying to avoid the pitfalls of neocolonialism. But the good desire to provide for the needs of hurting people can lead us to overly compensate and impose our ideals on societies—or subsets of societies—that do not want them, even if they do not even know that they do not want them.

On the other hand, though, we—the global aid agencies, workers, and sponsors—are trying to grow individual and institutionalized freedom and democracy in these countries so they can govern and guide themselves. This freedom is of utmost importance, and yet it does not easily lend itself to creating an organized society out of a semi-chaotic developing one. So, it seems there exists, or could exist, a tradeoff between cultivating freedom in the developing world and developing a high quality of living. On an even deeper level, instilling our understanding of "freedom" on some societies could be seen as a form of neocolonialism if those nations do not agree with or desire our democratic notions.

How then do we proceed? I do not know exactly, but my primary caution here is that large international development groups must not remove the freedoms and responsibilities of individuals and communities to provide for their own needs—and the needs of those around them—in the name of a "higher quality of life." An extreme, if fictional, example of a society where this caution was ignored is that of Aldous Huxley's *Brave New World*. In this brave new world, every need, desire, and whim of humanity is provided for by what earnestly seems to be an almost benevolent ruling body, intent on maximizing human happiness. The methods of providing this, though, are the dissolution of the oldest human institutions and traditions,

including not only religion but also the family, literature, and the freedom to think. Even child bearing, rearing, and education becomes solely the responsibility of the state through genetic engineering and psychological training programs. At the cost of freedom, then, literally comes world peace and the end of (almost) all ugly aspects of life (along with the annihilation of those members of society who do not agree with the new order). And this is not a boring, grey, world in which everything is dreary and people silently disappear when they ask too many questions, as in Orwell's dystopian future; it is a world in which everyone is "happy," occupied, and does what they want—why would they care to ask questions?

But this is not the world we want. We do not agree with the Controller of the brave new world that "We prefer to do things comfortably," when it means we give up our human freedoms. Any sane reader of Huxley's would scream "No!" She would find herself proclaiming with Huxley's savage: "...I don't want comfort. I want God, I want poetry, I want real danger, I want freedom, I want goodness. I want sin."

I am in no way insinuating that our current aid efforts and organizations are taking us down a path that will turn our world into one like Huxley's. I simply want to draw attention to the complexities of current development work, even in its purest theoretical terms, and I want to provide a word of caution about what could happen if we do not tread carefully. If we allow technology to fix all of our problems, technology may indeed fix all of them. But there may be no difference between us and our technology. We are on a path to a new world, a world in which poverty is a thing of the past and every man, woman, and child can live a healthy, fulfilling life, regardless of background. This new world is the peak of the mountain we are ascending, but on every climb there is potential for slipping and falling to disaster. Let us all think carefully and wisely to ensure that our steps are sure ones along this trek.

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