

**ENGINEERING INTERNATIONAL DEVELOPMENT:
THEORIES AND PRACTICES
OF CROSS CULTURAL SOLUTIONS**

by

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ABSTRACT

This project investigates issues of efficacy of non-governmental organizations (NGO) that work in a cross cultural setting. In the context of ecological anthropology, it explores issues of adaptability and processes for exchanges of technology between local cultures and NGOs. This theory holds that adaptations of communities to local ecological constraints are an attempt to maintain access to essential resources through development of political, economic, and technological structures. The adaptations related specifically to these structures include local innovations of ideas and technologies societies develop to fit concepts of need, want and benefits. Implications of this theory in response to NGO work involve the inclusion of these concepts in project design to facilitate the process of exchange and use of non-local adaptive technologies. Creation of culturally acceptable and long-term solutions contributes to fulfilling factors of sustainability of these NGO projects. In addition to the theoretical material, this paper investigates five secondary cases and one primary case involving Engineers Without Border-University of Delaware chapter concerning different approaches to changes in adaptive strategy around the world and explores specific factors that facilitate exchanges of these strategies across cultures. Amongst the factors discussed are inclusions of local perceptions of want, need, and success into program design and implementation. It is argued that this is best

accomplished by including communities in problem definition and solution design, and including mechanisms within program design that encourage innovations of these strategies at the local level. Ultimately, this paper recommends conditions under which these exchanges of technologies can occur so that proposals of change in adaptive strategy across cultures are more likely to act as successful and sustainable solutions.

Chapter 1

INTRODUCTION

My research investigates variables affecting the outcomes of the activities of non-governmental organizations (NGOs) working in the international development sector. Because there are an estimated 30,000 of these groups world-wide, the effects of their work have vast consequences, both positive and negative, for the populations that are intended to benefit from the work of the NGOs (Schuller 2007 68). The results of research and analysis on this specific topic, therefore, have important implications for theoretical issues in applied anthropology, specifically for those concerning organizational and conceptual approaches to community organization and for addressing policy questions about the efficacy of the work of NGOs in international development. These theoretical issues in my research revolve around a large body of perspectives concerning diffusion and acculturation, innovation, and ecological anthropology. Within these issues, the theoretical contexts include examining behavior interaction of different cultures and the transfer of ideas and technologies between them.

More specifically, the theoretical issues concern how and why communities as a whole accept technologies and ideas from other societies and the consequences of that acceptance. These specific frameworks predict that the transfer of ideas and

technologies from the NGO to the intended beneficiary will be more likely accepted if these are perceived by local community members as meeting specific adaptive needs, and are more likely to take place under conditions that allow people to modify projects to fit with their daily needs. Concerning development initiatives implemented by NGOs and other organizations from other cultures, this means that local definitions of “need”, “benefit”, “success”, and “failure” take practical and real priority over extraneous ones defined by the NGO. As community interactions with ecological constraints vary across societies based on individual perceptions of trade-offs and benefits, studying culturally structured processes, like economic organization, political dynamics, and gendered processes that come about as a result of these constraints have real consequences for understanding community adaptation, and ultimately, interaction with newly introduced technologies on the part of the NGOs. The theoretical implications are that NGOs will enhance their efficacy primarily by incorporating local concepts of need, benefits and success through the use of ethnographic information to create more locally-appropriate program designs and including mechanisms within program design that enable community feedback and change to community response to these exchanges of adaptive technologies.

Ecological anthropology offers theoretical frameworks that can be utilized to assist in the creation and maintenance of such relationships and for projects to truly be successful in a mutually defined way. Development organizations run on the platform of changing fundamental structures in society to “improve” lives, and, thus, the

significance of understanding the nature of exchange of values and knowledge is likely to determine if the proposed solution is considered legitimate for both the community and the NGO. Legitimacy in this case must be determined by local perceptions of benefits and success of specific technologies offered by NGOs to respond to perceived problems in the community. In order to understand these perceptions, the use of feedback loops between the local community and NGO to express these views must be used and programs changed accordingly to fit these perceptions as well as possible. Through an exploration of communications and feedback loops embedded in the developmental, implementation, and evaluation states of programs in specific case materials, this research hopes to illuminate the conditions under which programs can offer successful solutions to problems in a cross cultural context.

Other significant theoretical issues include those surrounding community organization. Primarily, the greatest problems of NGO efficacy are embodied in evaluation of projects between the conceptual development of a program and implementation, in which there is often a disconnect between the NGO's ideas and implementation and those of the population intended by the NGO to benefit from its activities. The basic theoretical argument is that program development requires a feedback system of regular communication between two agents [or sets of agents], a local population and an NGO, in order to discover and productively respond to definitions of need, benefit, success, and failure. Such communication and responses to it by both agents is more likely to result in a conception of success upon which both

agents agree, not only helping solve fundamental problems, but also working to create a relationship seen as equal and legitimate by both through which skills and knowledge can continue to be shared.

The theoretical issues will be discussed comprehensively in Chapter 3 after a presentation of secondary and primary research methodologies in Ch 2. Then, the secondary and primary data sets are described in Ch. 4. The secondary data sets include Thailand (Jian), Papua New Guinea (Cochrane), India (Pelto), Indonesia (Pisani), and Honduras (Engineers Without Borders—University of Pennsylvania). The primary data set encompasses programmatic activities of the University of Delaware Engineers Without Borders during the 2008-2009 period.

In Ch. 5, those data sets are analyzed in relation to the specific theoretical issues, and this is followed by discussions of the major conclusions about the theoretical issues and the policy implications of those conclusions. This chapter includes the implications of my results for anthropological theory, development policy, and, specifically, programs of Engineers Without, Borders.

The most important theoretical results of my work revolve around the issues related directly to understanding adaptive strategy cross-culturally. As communities respond to problems presented by ecological systems, community responses vary and have implications for the ways in which individual societies develop economic, political, and technological process that affect daily life. Within this context is an explanation relating to the ways in which people construct systems of reality,

ultimately concerning the ways in which people of individual societies view their own poverty as well as other's. The most important implications of my theoretical results for development and NGO policy relating to these local constructs are the need for organizations to have basic understandings of these systems in order to approach problems in adaptive strategy successfully. This involves the inclusion of mechanisms that encourage communication and appropriate responses between the NGO and the community in order to facilitate exchanges of technologies across cultures. Most important in this process is the perception of the NGO on the part of the local people as being a partner in this exchange, which is facilitated by long-term commitment to projects and open communication mechanisms. The most important implications of my results for policy affecting future Engineers Without Borders programs related to the NGO responses involve increasing interdisciplinary collaborations so that different academic perspectives can be included in the planning and implementation stages that take into account the problems of adaptation within specific communities. This also implies the need for more discussion based assessment of programs that include the community's needs and definitions of need, success, and benefits. Mechanisms for understanding the significance of these factors could be directly related to a required service learning class taken by all members of the group involving the teaching of anthropological concepts directly related to ecological anthropology.

Chapter 2

METHODS

This research took place over ten months at the University of Delaware under the guidance of Peter Weil to better understand the factors that determine the success and failure of non-governmental organizations (NGOs) that focus on poverty alleviation. More specifically, this research problem concerns the ability of NGOs to successfully approach local populations in ways that encourage the creation and implementation of intensive communication feedback loops, and the manners to measure and evaluate the overall sustainability of projects under local concepts of need, benefits, and success (see introduction).

Research for this project primarily involved investigation of the anthropological theoretical concepts of ecological anthropology and its relationship to cross-cultural development programs. Databases and journals were principally used order to develop a broad context explaining the nature of such projects and included *Anthrosource*, *Anthroplus*, and *World Cat*, which offered new publications that were used mainly to gather case material and further develop and explore theoretical constructions of international development. The journals *Human Organization*, *Practicing Anthropology* and *Human Ecology* were heavily used to develop the anthropological framework of ecological and political anthropology through articles

investigating different community interactions with environmental and societal forces. Books and anthologies involving cross-cultural development work and specific anthropological theories related to issues of reciprocity, gender roles, and World Bank activities. Included in the secondary material were technical reports from the national chapter of EWB and reports submitted by the University of Pennsylvania and University of Delaware EWB chapters. Case studies were used to support and develop theories under real world conditions, and include cases from Thailand (Jian), Papua New Guinea (Cochrane), India (Pelto), Indonesia (Pisani), and Honduras (EWB-UPENN). Sources for case studies came from the above mentioned journals, databases, and books.

In addition to this secondary research, ethnographic field work with the Engineers Without Borders—UD chapter (EWB-UD) was conducted following ethnographic research training instructed by Peter Weil in June and July 2008. This helped to establish a working relationship with the organization that included their enthusiasm for my undertaking field research on their work in the Bamendjou region of Cameroon. The ethnographic portion of the research began in the beginning of September when Engineers Without Borders began their semester meetings. This work included attending weekly meetings, as well as unstructured interviews with members of the executive board and travel team specifically investigating the perceptions of problem definition and their processes for developing solutions. Further methods involved systematic observation and casual conversation with

strategic members of the group, which mainly included the executive board, travel team, and the faculty advisor.

My work in Cameroon primarily included systematic observation (via notes and digital imaging) and documentation of EWB's programmatic activities on the ground and the related community behavior. In addition, open-ended interviews with the Bakang community members were conducted to help explore community perceptions of poverty, adaptive need, the EWB group, and the project. This interview component was reviewed and approved by the University Human Subjects office, and involved discussions with community members who were both heavily involved in project management and those who were heavily involved in project use. Interviews were also conducted with those who had little or no interactions with the projects to develop a better understanding of local adaptive strategy and overall community perceptions of the work of EWB-UD. This ethnographic research occurred during the period that Engineers Without Borders was in Cameroon in January of 2009.

Chapter 3

THEORY

Introduction

Expansion of international development aid over the past century has become an issue of central interest for anthropologists concerned with human adaptations to the environment. Researchers have found that these adaptations involve both short and long-term socio-cultural responses that have consequences for the societies themselves, the health of their members, and for the environments to which they are adapting (Abruzzi 1982; Cochrane 2009; Cronk 1991; Kottak 1999, 2004, Markowitz 2001, Moran 1991, Orlove 1980; Pottier 2007; Vayda 1983; Winterhalder 1980). Based upon studies investigating these long-term socio-cultural responses, ecological anthropologists have concluded that examining these adaptations of societal structures is one of the most informative ways to begin to understand the culture of a people and their related actions (Kottak 2004: 502; Moran 1991: 361; Orlove 1980: 237; Winterhalder 1980: 136). These studies investigate cross-cultural processes, such as communication, production and distribution strategies, and the uses of power and authority by individuals and groups to reveal patterns of action and related concepts within a single society and amongst societies. More specifically, these frameworks

examine the reasons for which specific communities and societies as a whole accept technologies and ideas from other societies, as well as the consequences of the acceptance (Marx *et al.* 2006: 52; Vayda 1983: 268; Winterhalder 1980: 146).¹

Within the context of this paper, results from ecological anthropology become the foundation for arguing that the most effective transfers of knowledge and technology across cultures by external agents, such as NGO's, are likely to occur under instances where each receiving group finds them valuable as adaptive resources (Kottak 1999: 25; Moran 1991: 376, Vayda 1983: 275). Technologies, knowledge, and resources used across cultures, therefore, must go through innovations at the local level to fit locally-defined adaptive needs.

In order to encourage local adaptations of NGO projects, the program design must design in determination by local societies of their own definitions of need, benefits, success and failure of outside agency activities (Fonjong *et al.* 2004: 431; Markowitz 2001:43). This central design component is necessary so that the implementation of a given project is as appropriate as possible to the needs of the community. The issue of locally-defined appropriateness, in turn, theoretically has the benefits of encouraging local innovations, and thus adaptations of the technology and local maintenance of programs. This is a concept which is believed to be essential to sustainability and the spread of experiences with the technology to other areas of

¹ The creation of alternative technologies by individual society members and the processes of acceptance of those as cultural innovations by other members of society is also common and recognized (e.g., see Kottak 2009). However, the focus of this inquiry is on technological and adaptive changes related to the role of external agents in their introduction.

adaptive problem solving that are consistent with local definitions of “development” (Cochrane 2009: 71, Kottak 2004: 506; Markowitz 2001: 41, Pottier 2007: 124). In instances where community definition of the problem is not involved, the definition of local society needs by outside agents tends to be based upon their preconception of their own specific mission and abilities. This, in turn, creates interference between the local processes, both technical and cultural, and the culturally different technologies. The interference can be influenced by several negative factors, which ultimately encourage groups to not use or maintain the new technologies (Fernando and Heston 1997: 8). In regards to NGO programs and related activities, this implies that a mutually supported investment in understanding and explaining local conceptions of need, benefit, success, and failure will determine the efficacy of the NGO activities (Pottier 2007: 151, 154; Roche and Kelly 2005: 180).

Understanding the ecological adaptive contexts thus is seen from the perspective of anthropological theory as the first step in identifying the needs of any social group (Cochrane 2009; Cronk 1991; Kottak 1999, 2004, Markowitz 2001, Moran 1991, Orlove 1980; Pottier 2007; Vayda 1983). NGOs or government organizations need to have a comprehensive understanding of these contexts before program design begins for any specific population. A fundamental aspect of NGO work then becomes developing a framework for examining the way that a specific society views the world, including a locally determined definition of its problems and needs, as the local constructions of these factors will vary significantly, even within

the same society and the same ecological zone, much less throughout a whole country (Cochrane 2009: 1, Kottak 2004: 506).

The use of development aid then, in the purest sense, should act as an adaptation to an ecological constraint which causes problems relative to demographic, energetic, or nutritional success (Cochrane 2009: 24, Pelto 2002: 190, Pisani 2008: 63). The cultural conceptions and implications of these issues, therefore, need to be clear to both the NGO and the local population in order to understand the factors that will define degrees of “success” in the development activity (Abramson 1999: 240; Marlor 1999:216; Pottier 2007: 50). More importantly, however, is the significance of understanding the development of these adaptive properties, as each adaptive strategy will exhibit both negative and positive effects. Adaptation to ecological constraints is not uniform if the ecological constraints are not determined by similar historically-situated causations. Even if communities share similar ecological conditions, adaptations to similar constraints can vary in relation to a society’s adaptive history (Orlove 1980: 263). This means that all attempts at adaptive solutions involve trade-offs between different benefits, and the local populations ability to adapt successfully is based on their active participation in weighing those trade-offs (Marlor 1999: 217; Marx *et al.* 2006:53; Moran 2002: 15; Orlove 1980: 244). Moreover, with a more thorough understanding of the cultural processes that influence certain paths of adaptation, NGOs face a much higher probability of success, as they will not be promoting maladaptive tendencies for the given environmental and

social constraints. When these factors are not considered in program development, aid is more likely to stimulate maladaptive behavior or even to fail due to the local population's refusal to participate in the development initiative as an adaptive measure (Markowitz 2001: 41; Vayda 1983:1). Therefore, NGOs that maintain a focus on the individual adaptive strategies tend to be able to develop their program frameworks to fit community perceptions of need, want, and success, ultimately creating an open exchange for the transfer of technologies across culture.

The Development of "Global" Poverty: How the West Defined the World's Problems

Drawing on the theories discussed above, a program that includes these cultural conceptions and community-based definitions of "development" increases the probability that a program will be successful in creating strategies perceived as adaptive and relevant by local populations. At a minimum, this requires long-term discussions between community members and staff of the external agency before design and throughout implementation (Esterberg 3, Kottak 2004: 503, Pelto 2002: 172; Pisani 2008: 35). Adaptive strategies are likely to be understood if the NGO develops a comprehensive description of the factors that determine decision making in communities, meaning that organizations than have access to the knowledge systems to ultimately make their technologies more marketable to local populations (Marx *et al.* 2006: 48). This process is far more likely to be productive and effective if the external agency has access to the results of ethnographic field research, which can take

up to several years. These results can be utilized by the agency to assess program needs and best practices of implementation (Bhattacharyya and Murray 2000:255-6, Jian 2001:15, Esterberg 2002:2), but also to regroup and re-access development statements after problems arise with either the program goals or the community perceptions of programs (Kottak 2004:506).

It is common, however, that programs designed out of country and by Western agents, will tend towards westernized concepts of development as opposed to local ones when they lack access to ethnographic information (Cochrane 2009: 4; Fonjong *et al.* 2004: 434; Jian 2001: 85; Pfeiffer 2004: 360; Schuller 2007:68), meaning that they lack valid comprehension and integration of the cultural beliefs and knowledge systems of the communities in which projects are to be implemented. These ethnocentric beliefs and actions in NGO projects stem from a long history of fear and disdain for systems that contained different ways of living and being.

Concepts of ethnic superiority were not new to the nineteenth century when colonialists first started expanding into communities all over Africa and Asia and became a more directly present force in Latin and South America. The further development of the liberal tradition accentuated these western perceptions of the inferiority of non-western worlds. Consequently, a certain intellectual authority was assumed by those in control of “civilized” knowledge (Firmin-Sellers 2001: 44; Geary 1997, 47; Owusu 705). The perception promoted the idea, however, that there was a certain antiquated tradition of linear “development” in terms of technological

advancement, and therefore western values and ideals could be shared to improve society within these other countries (Geary 1987: 43; Ranger 1997: 603). Modern anthropological study however, indicates that knowledge, belief, and ideological structures are founded entirely on local systems, and traditions completely unrelated to the perceptions that were ascribed to them by the colonialist ideology (Brain 1969:19, Firmin-Sellers 2001: 48; Rangers 1997: 598-602). As previously mentioned, ecological anthropologists indicate that individual societies adapt to fit certain ecological constraints, indicating that there is no one proper direction in adaptation and therefore, development. Because multi-faceted adaptive responses were not considered in colonial times, however, the colonialist regimes based programs and work in their countries on western concepts of development. Colonialist governments worked to “improve” (read: make more westernized) the local government systems by increasing the western systems of technologies in the country and working towards centralized governments, ignoring the fact that individual societies already had workable and legitimate systems of managing resources and conflict (see Weil 1971; Gibbs 1963). The result of this was that the attempt at new systems created stresses on the previously existing systems, and the reactions to these stresses were often perceived by the western regimes as being too primitive to understand.

This approach to development has not changed all that much over the past century, and it has become the fundamental rationale of the international development sector (Beninguisse 2004:169, Fonjong 2001: 233; Ranger 1997: 609). Western

thoughts and technology do not necessarily integrate well into other cultures because the nature and physicality of ideas and objects themselves are culturally embedded, which makes it difficult to exchange technologies without some cultural meanings or significances embodied in them. The lack of acceptance or maintenance of these western concepts is often explained by NGOs as community misunderstanding of importance of the technology, or as the functions of a thought system alleged to be a “primitive” one by the benefactor (Comaroff and Comaroff 1997: 692; Kottak 2004: 506). Because community members intended as “beneficiaries” are not usually given the opportunity to define their own problems and the surrounding cultural perceptions of them, however, it is possible, even likely, for external organizations, such as NGOs, to attempt to implement something that is not beneficial adaptively for the intended beneficiary. (Bare 1998: 62; Geertz 1963: 146, Keare 2001: 161). People are not inclined to seek out new and innovative technological and / or organizational production and processing methods unless they perceive some environmental constraint that impels the creation or acceptance of that new method (Moran 2002: 113). Accepting these maladaptive strategies would not only be detrimental to the general longevity of the society, but would also take away people’s rights to define their conceptions of progress and development for themselves.

The concept that communities are “under” developed is commonly manipulated in development projects in order to assert rights of authority of one group (typically western) over another (Beninguisse 2004: 169, Fonjong 2001:233; Ranger

1997: 609). As western forms of development organizations, most NGOs tend to approach community problems as issues of “development” instead of as locally based problems (Cochrane 2009: 1, Nelson 1995: 6; Pisani 38). The larger context of these discussions concerns programs attempting to develop action plans to deal with adaptive technologies and strategies fall into two dichotomous approaches (Keare 2001:159): 1) top-down programs, which focus on dealing with government issues and trickle down effects to the people, and 2) bottom-up programs, which primarily center around facilitating the community’s access to the resources it needs to sustain itself without major government or other top-down assistance. Both offer benefits and weaknesses in terms of dealing with adaptive strategies, but it is because bottom-up programs tend to be more aware of and inclusive of these cultural processes that they are more highly favored by anthropological theory as a more effective method for dealing with poverty alleviation (Keare 2001:160, Mehta 2001:194, Pelto 2002:190, Bhattacharyya and Murray 2000:255).

Top-Down Programming

Top-down programming supports poverty alleviation through gross economic development, structural adjustments programs, and spreading knowledge of World Bank concepts (Keare 2001:160, Mehta 2001:189-92). Programs running on this system generally have levels of funding that are high relative to both entities in the private sector and to NGO’s, which encourages and enables them to increase the scale

of their projects. The largest single organization taking the top-down approach is the World Bank, which spends a great deal of time and money developing these poverty alleviation programs. Within the organization are four main sectors that focus on different aspects of development, all of which claim to promote sustainable development through loans, guarantees, risk management products, and non-lending analytical and advisory services (World Bank Annual Report 2008: 11). The minimum amount committed in loans was from the Multilateral Investment Guarantee Agency. Established in 1988, they have committed over \$19 billion that aim to provide political risk insurance or guarantees that promote foreign direct investment into developing countries (World Bank Annual Report 2008: 12). The International Finance Corporation has contributed the second lowest amount of \$32.2 billion since 1956, which is followed by the International Development Association with \$193 billion since 1960. The sector that has contributed the most money has been the International Bank for Reconstruction and Development, which has loaned countries \$446 billion dollars since 1944, with the majority of funds invested in projects designed for Africa (see Table 3:1 in Appendix). In the fiscal year of 2008, the World Bank provided \$5.7 billion in loans, credits, and grants to Africa alone to finance the 91 projects located on the sub-Saharan part of the continent. The total amounts of loans given from the World Bank in their total existence falls just under \$700 billion. Predictions about their effects on global populations involve estimates that by 2015, the share of the population in developing countries living on less than a dollar a day

will stand at 10%, and total levels of people in what the World Bank defines as extreme poverty are predicted to fall from 970 million to 624 million (World Bank Annual Report 16). The attempts to alleviate poverty involve different strategies based on continental characteristics, but generally involve massive overhauls of government structure based on World Bank standards and programming.

This type of programming often generates greater operational costs, both bureaucratic and on-the-ground, and involves more extensive technological exchanges. Because of the greater exchange of so-called “adaptive” technologies, organizations spend much less time determining local definitions of the problem and more energy convincing country governments that the proposed technologies are needed (Fonchingong 1999: 73; Golub 2007: 42). This lack of knowledge of locally defined perceptions of want and need stem from the colonial ascriptions discussed earlier within this chapter, in which outside organizations assume a superiority over other groups based on monetary wealth or more “developed” systems of knowledge surrounding technology. This approach to development, however, does not acknowledge the historical and cultural contexts of the origin of the problem, which may be keys to developing a long term solution.

Thus, top-down organizations and relatively standardized, generic programmatic approaches to the problems they stereotype are seen by anthropologists as being less likely to either acquire or use this kind of information in designing or implementing their programs to tailor them to specific needs and problems of local

populations (Keare 2001: 164). Through these actions, the World Bank directs program frameworks and funding, both in the forms of loans and gifts, towards the national governments of what the Bank deems “development worthy” to be primarily implemented by the governments from the top down. The goal of these programs becomes mobilizing knowledge and experience of World Bank members to improve decision making abilities of rulers in other countries (Mehta 2001:192; Nelson 1995:6). The projects themselves, therefore, tend to be overly optimistic and culturally irrelevant to many of their targeted populations (Bare 1998: 322, Cochrane 2009: 25; Keare 2001: 164).

Bottom-Up Programming

In the context of the ecological theory previously discussed, small scale programming offers solutions to the problems addressed above for the reason that their local-level orientation offers them more opportunity to explore problems defined by the community. In these organizations, their implementation activities are private organizations rather than government agencies that are undertaking the development activity. The small scale of bottom-up programming, however, ideally should enable organizations to develop their programs to react quickly and positively to government or political constraints (Abramson 1999: 244; Keare 2001: 162, Pelto 2002: 190; Pfeiffer 2004: 358). These reactions, in theory, should determine program longevity and ultimately, community ownership, by trying to reduce issues of asserted power on

the part of the NGO. Furthermore, many NGOs work heavily at the local level, taking great pains to develop programs in which the community can be heavily involved.

“The NGO model...differs from that of the World Bank by being partisan, process-oriented, and participatory. NGO’s partisan character derives from overtly taking the side of poor people and communities”² (Nelson 1995:6). Bottom-up programming often involves a smaller scale than top-down, which has implications for both the strengths of NGOs and their often-cited success and for their weaknesses (Markowitz 2001:40, Mehta 2001:194, Pelto 2002:189, Pfeiffer 2004:359). The latter includes their being seen as competing with government agencies and capturing resources that a national government sees as supporting their own bureaucratic growth and priorities. Moreover, this bottom up approach is often seen as competing with the government’s authority and power, as most bottom-up programs work around government constraints (Abramson 1999: 244; Keare 2001: 162, Pelto 2002: 190; Pfeiffer 2004: 358). Working closely with local agencies and developing and understanding of local processes over a period of time, however, can increase the abilities of the NGO to engage in real changes across cultures.

² I will argue later in the paper that this idea is not always the case, which will be the basis for my research question. For purposes of distinction, however, at this point, I will use this definition as a manner to differentiate it from organizations like the World Bank.

Community Discussion and Interactions

Bottom-up programming, therefore, is more likely to have the approach that encourages projects based on local perceptions and realities of need, want, success, and benefits. This translates into creating programs with frameworks to examine and understand the current adaptive strategies, as well as culturally appropriate forums through which feedback on perceptions of these strategies from both communities and NGOs can be given and used. Community based programs require both discussion with the community and constant assessment to determine the way to best make a program and community fit (Forbes 2002: 201, Galub 2007:43, Cochrane 2009:43). The adaptability model of NGO work implies that the more adaptable and sensitive an NGO is to needs defined by community members, the more able the NGO will be to create an environment in which the communities have access to the resources they need to solve problems they define and prioritize on their own terms. This interaction with the community, therefore, requires different types of feedback loops between the community and the NGO to create a high level of adaptability on the part of both parties in order to form the most effective definition of and solution to a problem.

Poverty and Access to Resources

An approach that attempts to include communities in problem definition and project design relies on the capacity of organizations to understand the significance of local processes and adaptations that might not be apparent in initial feedback loops. The policy implication, therefore, is that the success of NGOs will be based on their

development of an understanding and inclusion of a predicted reaction to externally-introduced technologies in projects that are introduced to alleviate adaptive problems related to poverty. As western conceptions primarily revolve ultimately around monetary factors as a demonstrative standard to measure degree of development in terms of wealth and poverty, the tendency is for western NGOs to project this perception onto other cultures (Cochrane 2009: 1; Fonjong 2003: 434). Because of the theoretical inferences of ecological anthropology, however, poverty cannot be seen by NGOs working on adaptive strategy as a “homogeneous category for which objective, quantifiable, cash income/material consumption standards [can] be defined and measured” (Cochrane 2009:1). Non-western societies historically have developed other ascriptions of the meaning of poverty related directly to their locally determined adaptive strategies that do not relate to monetary factors, which ultimately change the perceptions of valuable solutions presented by the NGO. This implies that a single solution for solving poverty based on increase in access to western concepts of wealth (similar to the World Bank approach) is less likely to solve problems in local adaptive strategy, as communities will see programs as lacking benefits to their local systems to ensure access to resources.

Reciprocity and the Effect on Constructions of Poverty

In communities where the market principle does not dominate, adaptations have followed different paths to increase the security of groups in the acquisition of

essential goods and services for survival. These adaptations are based on concepts of reciprocity and the exchange of seemingly “free” gifts instead of monetary exchange (Mauss 1954: 5). Three main forms of reciprocity exist: 1) negative reciprocity, 2) generalized reciprocity, and 3) balanced reciprocity. Negative reciprocity involves exchanges, in which one party, often under coercive threat, gives significantly more than the other, and the gift is either not at all returned or only something of smaller, culturally-determined lesser value is immediately returned (Carrier 1991: 123).

Negative giving in this nature creates images of stinginess, and ultimately problems between groups of people because of illusion of power or wealth of one group over another (Mauss 1954: 13). A subset of reciprocity that appears very similar to negative reciprocity is called “aggressive giving” which results in similar issues of distrust and anger between groups of people. Negative reciprocity, in this sense, acts as a way to assure power or influence over another, and can be used in instances of coercion (Carrier 1991: 173; Mauss 1954: 14; Stirrat and Henkel 1997: 73).

Generalized reciprocity, in contrast, occurs when one party is committed to giving without specific calculation of receiving any type of compensation at any specified time. The timing of a return gift and the value of it thus are unspecified, and therefore, “general.” The relationship between parent and child, for example, is one based universally on generalized reciprocity. This form of reciprocity tends to be viewed much more positively by participants, and has been treated in the theories of anthropologists for nearly a century as constituting a fundamental form of social glue

that creates societies not dominated by the market principle (Mauss 1954; also see Sahlins 1997).

Generalized reciprocity, outside existing families and kin, is usually reached through experimentation with balanced reciprocity which is characterized by immediate *quid pro quo*. After a level of trust is established through equalized gift returns from either involved individuals or groups, the level of trust tends to be created, so that the two parties gradually become engaged in generalized reciprocity (Mauss 1954: 21, Malinowski 1932: 81). Generalized reciprocity, created in this way, is seen as acting as a strategy through which people build alliances and relationships throughout the community to attempt to ensure levels of security for both the giver and the recipient. Such events involve the two parties sharing gifts with each other that may not be of equal value initially, but the overall belief surrounding the principle of generalized reciprocity on the part of the participants is that eventually the favor or gift will be repaid in whatever form is needed by the initial giver, which may be far more or much less in value than the original gift (Mauss 1954: 26, Sahlins 1997: 81). Engaging in this type of reciprocity acts as an adaptive strategy to optimize security in times of hardship and creates a social network through which this occurs.

Theories about factors affecting the success of Western NGOs propose the necessity for the organizations' understanding culturally individualized systems of reciprocity in designing and implementing development projects. Thus, larger donor groups that focus on issues of globalized [read: general] poverty instead of local

conceptions of poverty and need are more susceptible to offering solutions that are perceived by the “beneficiaries” at the local level as taking from them and the donor group as receiving nothing or very little in return. This is a classic definition of negative reciprocity. From the perspective of the recipients, they are engaged by the NGO or other external social agent as recipients of gifts they can never repay and, yet, feel they should. This sense of “should” puts the recipient community into a long-term weak, even disabled, position, relative to the NGO, resulting in often long-term resistance to future participation by the recipient community (Stirrat and Henkel 1997: 76). This perception is a classic example of “aggressive giving,” something very close to negative reciprocity. This combination creates a self-reinforcing, tension-building relationship: the donor group perceives of itself as being conned and the recipient group has a sense of being dominated and made weaker. These are the conditions that frequently characterize the relationships of failed development programs (Abramson 1999: 243; Forbes 2007: 197; Lea 2008: 79; Lister 2003: 180).

This counterproductive relationship between NGOs and local communities can become exacerbated as the nature of the gift itself changes from material to informative. Specifically, the problem becomes magnified when NGOs start giving advice instead of material objects (Mehta 2001: 81; Stirrat and Henkel 1997:78). Thus, in the information giving stage, two things often are taking place at the same time: 1) the western NGOs see themselves as being in possession of more “legitimate” (often termed by them as “real”) knowledge systems that they are going to “give” to

the “poor” (and thus “ignorant”) and 2) it becomes impossible for the community to create an environment in which a gift can ever be reciprocated (Keare 2001: 160; Mehta 2001: 189; Stirrat and Henkel 1997: 76). In this instance, the NGO is in a position of superior power and, thus, dominance. This puts the community in a very uncomfortable position, in which they are required to receive something and purposefully give nothing back (Sahlins 1997: 73; Stirrat and Henkel 1997:78). Based on current theoretical constructs supported by many case studies, anthropologists have concluded that the understanding of and taking actions based on that understanding of these systems of reciprocity and, ultimately, relationship building activities by NGOs, is more likely to create conditions of successful project creation and implementation (Marlor *et al.* 1999: 216).

The implications for collaborations of local communities and organizations therefore, are that the nature of relationships can change from that of giver and receiver to a partnership between organizations bringing different but equal resources and skills to bear on the problems of development” (Stirrat and Henkel 1997: 75). The theoretical results of some field studies of NGO programs locally defined as successful are the basis for suggesting that a productive, generalized reciprocity based gift giving relationship can be built and grown through interaction with these new people coming into the community. Many of these relationships will need to be tested to determine the strength of individuals, as well as the bond between groups. Through this process, however, the relationship may be determined by both parties to be one of mutual

respect. This kind of relationship contrasts strongly with the one of power, the kind that cannot be avoided in a fast-track approach to development.

Gender Perception and Cross-Cultural Understandings

The issues of power and equality related to the theory of reciprocity have specific implications in instances where projects assume concepts about gender roles that are inaccurate. Gender roles within a given society are influenced by the combination of economic, social, and environmental constraints fundamentally embedded within the culture, and are determined in much the same way that constructions of poverty are formed (Davids and van Driel 2005: 6). In many non-western societies, women can appear to lack agency or authority within their communities based on divisions of labor and general conceptualization of gender proposed by the local population when often they have a great deal of responsibility and influence within their community (Emmanuel 1995: 517; Fonjong 2004: 5, Pottier 2007: 107). The responsibility of raising children, gathering water, preparing meals, and other miscellaneous tasks are usually in the charge of women, meaning that development projects often have a significant effect in their daily tasks (Guyer 1980: 347; Pottier 2007: 20). In fact, the literature suggests that inclusion of local women in design and implementation of development projects can be a determining factor in the success of projects working to alleviate poverty (Bhattacharyya and Murray 2000: 256; Fonjong 2001: 223; Perry 2002: 31). Understanding the variation in gender

conceptualization, divisions of labor, and managerial roles is an essential component to programs of technology transfer to increase local investment in program sustainability.

The trend, however, is just the opposite: women from different cultures are often grouped together in contexts like those in “global” poverty by NGOs and human rights groups. This stereotyping approach implies that all women share the same ideologies and struggles regardless of cultural background, and acts a kind of a “cultural imperialism...imposed on women who are not in the western world” (Davis 2005: 79). Failing to take into account the terms in which women and men in a particular social system see themselves and their gender roles can lead to mass generalizations and value statements regarding the way women should be living, an idea which does not successfully support efforts of agency and deference within a society (Abu-Lughod 1986: xxi), and again can create perceptions of aggressive giving on the part of the NGO. These generalizations and statements can contribute to the failure of NGO development activities. Determining solutions to problems with community feedback, including self-definitions of opportunities for participation by varying subgroups within the genders, could result in mutually overlapping definitions of project design, implementation, and success. Varied gender-based perceptions of want, need, and benefit would more likely be understood and incorporated.

This is a difficult issue. The risk is that local men will not allow women to participate in the expressions of their varied interests or that only elderly women of an

upper class will be allowed to speak in a very unrepresentative manner for all women, reinforcing the very sexism that the NGO was trying to avoid. Most argue that some initiative by the NGO is needed, but the initiative is not to be aimed at “women” as a category but at discovering and communicating with the many groups or subgroups of women in the community.

Evaluation and Assessment

Assessment of the outcomes of the activities of NGOs, therefore, becomes a problematic task. If the hypothesis of adaptability is indeed strongly supported (i.e. that success is based on adapting NGO activities to local needs based upon local perspectives of those needs) then assessments must also change across the board to reflect the local perceptions of the problem and reactions to the exchange of technology. This idea returns to Cochrane’s theory of culturally constructed concepts of poverty: for a project to truly be labeled “successful” by a community, the project must respond and correspond directly to their needs of how they view their own poverty. Formal assessments, however, do not usually get to the heart of these issues as a result of the lack of communication feedback loops (Jordan and Putz 2004:346), the outcome of which ends in responding to the agencies perceptions of need, want, and success or failure. The difficulty then lies in finding ways to define measures of success in communities that apply to both the NGO and the intended beneficiary population in order to create more sustainable systems of technological exchange.

The difficulty with the anthropological approach to ethnographic research is that it primarily provides qualitative results. In contrast, NGOs tend to want quantitative results to indicate success, as the international donor community allocates much of its funding to those with “legitimate” (read: quantitative) results (Esterberg 2002: 6; Elyachar 2006: 417). As previously mentioned, perspectives of non-local parties tend towards the belief that they know what is best for a specific community, regardless of their knowledge of local cultural knowledge systems, and numbers can act to successfully convey all they are interested in knowing. Thus, NGOs will often turn to quantitative methods in their attempts to ensure their longevity and prove their success to these outside parties (Jordan and Putz 2004:352, Markowitz 2001:43).

Evaluation

Measures of success that apply to beneficiaries as well as NGOs and affiliates must come from individually defined concepts from both of these groups. The exchange of technology across cultures is bound to create new problems within the cultural system, and with appropriate adaptive strategies on the part of both the NGO and the community, solutions to these problems can be addressed immediately and before long-term problems develop. This requires the use of regular feedback loops between different groups of beneficiaries and the NGO in the form of open-ended interviewing, public forums, questionnaires, and systematic observation (e.g., see Forbes 2002: 201, Galub 2007:43, Cochrane 2009:43). This is complicated by the

type and timing of evaluations, i.e., before, after, or both in the process of the NGO's local activity. With such evaluation, programs can be adapted, improved, or changed to better fit the goals of the intended beneficiaries, NGO, and donors. The real difficulty in evaluation however, lies in the different perspectives of those working and involved in the projects. Even with objectively based evaluations, it is possible for different players in the development field to find vastly different results based on their academic and personal background (Pitman, Feinstein, and Ingram 2005). It is essential, therefore, for evaluators to take into account not only the biases of those they are researching, but also to be mindful of their own personal views on a development program. Stewart (in Pitman *et al.* 2005) continues this discussion of examining evaluation practices by suggesting essential questions that should be included when taking into account the extent of NGO effectiveness.

These questions, while applied in a non-anthropological context, still serve as a good model for evaluating efficacy. They are: 1) what are the goals of the organization, 2) what methods, if any, are used to evaluate the outcomes of the project. First, Stewart (in Pitman *et al.* 2005) suggests an exploration of the goals of the organization to determine whether they fit the adaptive needs of the community. Generally, NGOs need to fit three main categories of legitimacy in order to be successful in their work with adaptive strategies in cross-cultural settings, which include regulatory, cognitive, and normative legitimacy. The first refers to a need for the NGO program to fit with existing laws of the country and the community; often

times this attempt at legitimacy is easiest to obtain. The second requires conformity with the cognitive structures in societies, meaning that the goals and actions of the organization should be congruent with the way in which people view the world, and the last is a combination of the first two objectives (Lister 2003:179). Including local viewpoints of benefits and need within program evaluation thus encourages evaluative methods that best describe the relative success for technology exchange in communities as a whole.

The goals of the organization, however, are not the only way in which effectiveness should be measured, and act only as the initial step of the approach to evaluation. A second important issue that Stewart poses is determining the ways in which achievements should be measured (Stewart 2005: 13). This is probably the most complex question to examine, for as mentioned above, local perceptions of need and benefits between the NGO, the community, and sub-groups within the community are likely to be incredibly different based on locally determined adaptive factors. It is likely that projects will not satisfy adaptive need for all parties involved, and therefore there is a need for evaluation that includes data explaining the success relative to the target populations. The anthropological trend here is to look at qualitative data (Esterberg 2002:2, Wilson 1998:245, Jordan and Putz 2004:346) in opposition to quantitative data, as “quantitative research is not particularly useful in revealing the meanings people ascribe to particular events or activities; nor is it well suited to understanding complicated social processes in context” (Esterberg 2002:2). Jordan

and Putz note that while standardized assessments (they refer to this as “documentary assessment”— “objective” and “quantitative”) have their uses, particularly in relating ethnographic research to the larger world (and donors), inherent and discursive assessments can be more informative regarding the social processes to which Esterberg refers (Jordan and Putz 2004:347).

These types of processes include listening to and interpreting casual discussions around the homes of community members, interactions between certain members of the community, and ultimately just watching for changes in behavior and action to see how the exchange in technology and ideas has changed its surrounding environment. While this type of field work can seem superfluous (Toussaint 2007:173) to those who prefer more objective methods, these methods can be crucial to the project’s success, as it is under these circumstances that real ethnographic information can be gathered, and embedded and ambiguous cultural perceptions can be made clear. “Conversations and spending quiet or noisy time together not only elicit[ed] data, but also generate[d] substantive debate...Such time, too, opened up valuable opportunities to discuss people’s questions or concerns about a project going on at the community’s home...” (Toussaint 2007:173). This type of information is essential, not only to understanding project impact and completing feedback loops to improve program development, but also to creating levels of trust and equality between members of the NGO and the local community (Markowitz 2001:43 and Elvacher 2006:417). This trust and knowledge can be used to further develop adaptive

methods and to change programs to fit the locally constructed issues that may heavily influence the outcome of projects.

Conclusion

In the context of ecological anthropology, the locality of constructions of poverty ultimately determines communities' response to problems in access to resources. The efficacy of NGO programs, therefore, in theory, depends on understanding the local perceptions so that programs can be designed to fit locally determined adaptive need instead of gross generalizations of poverty related to monetary wealth. Within these contexts, communities must engage in local innovations and adaptations of new technologies to further ensure that they fit these perceptions. Procedures that underestimate the efficacy of local adaptations and innovations are more likely to develop programs that are perceived by beneficiaries as maladaptive. Furthermore, the theoretical material supports an exchange of ideas regarding these perceptions and strategies through actively initiated communication and feedback loops to not only promote legitimate changes to adaptive strategy, but also trust and levels of equality between the NGO and the local population. In the next chapter, the theoretical implications researched in this chapter are explored in case material that includes both primary and secondary data from development activities around the world.

Chapter 4

DATA

Introduction

According to the theories of ecological anthropology presented in the previous chapter, NGO and development initiatives are most likely to be successful when communities and organizations alike are involved in communicative relationships that convey concepts of need, want, benefits and success. When these perceptions are ignored, recipients of aid become subject to technologies that do not fit their adaptive needs and create relationships between the external agencies and intended beneficiaries that are counter-productive to the identification and solutions to real development. Therefore, the results include maladaptive or inappropriate responses to problems caused by local constraints. This chapter explores five individual cases taken from the secondary material to provide a basis for examining the adaptive and developmentally productive value of systematic intentional external development agency-community discussions and interactions. Success (and failure) in the following cases follows trends related primarily to the extent of the inclusion of communities in defining the problem in real and local terms. Results of this factor predict outcomes for entire projects, including community acceptance of new technologies and

participation in implementation and longer-term maintenance. In instances where local innovation of new ideas and materials is encouraged, NGOs tend to see better relationships with communities that allow for a continuation of transfers of knowledge and technologies.

The secondary data comes from various sources and includes information from Thailand (Jian 2001), India (Pelto 2002), Indonesia (Pisani 2008), Papua New Guinea (Cochrane 2009), and Honduras (Engineers Without Borders--University of Pennsylvania chapter 2006). Following the secondary data is primary data resulting from research on a potable water initiative undertaken by the Engineers Without Borders--University of Delaware chapter with a community in the Bamendjou province, Cameroon that I observed first hand.

Secondary Data

The data presented from secondary cases encompasses issues raised in the materials discussed previously within the theory chapter. Local concepts of need, benefit, and success are particularly important within this material, as they are directly related to the extent of local involvement and maintenance of government and NGO programs.

The first two cases presented are not NGO programs, but, instead, large scale and top down projects implemented by the World Bank and government agencies. In

these cases, the programs are founded on western concepts of development, and ultimately result in significant problems for local adaptive systems.

In contrast, the last three cases, those from India, Indonesia, and Honduras, involve strong dependence on two-way communications (see “feedback loops” in Ch. 3 above) to not only define solutions, but also the problem itself. In these cases, community involvement and response to programs causes change in initial program goals, but ultimately results in creating a long-term solution to a problem not easily-solved by local adaptive measures.

Thailand

The case in Thailand took place in a small village in the northern part of the country that was involved in a development program entitled the Royal Hilltribe Development Program (RHDP) that was intended at a formal level to address productivity issues in local agriculture. The RHDP efforts were significantly funded and guided by the USDA (United States Department of Agriculture Foreign Service). While there were general benefits to this project, problems that arose after implementation were not investigated by the agency, and consequently caused difficulties in adaptive strategies that the village was not equipped to deal with on their own. The lack of feedback mechanisms, as well as involvement from the agency *after* implementation made it difficult for the organization to address long term problems in

nutrition and food security that came as a result of Greenhill's involvement in the program.

The village of Greenhill is located near the Thai-Myanmar-Lao border region in the northern region of Thailand. Prior to 1970, about 400 people lived in 40 households throughout a village that consisted of about 1,500 acres (Jian 2001: 80). Land ownership was communal, i.e., directly related to the tribe. Individual households had no direct claim to the land, making land ownership seem generally ambiguous to the Westerners involved. Subsistence revolved around swidden agriculture to produce dry rice, corn, and chili peppers, some of which enabled farmers to invest in a small and locally based economic system to supplement remaining caloric needs. Hunting and gathering also contributed to fulfilling regular energy requirements. Opium was grown in abundance as a cash crop. While usually not used as a drug by villagers, it was a key element in trade with nearby groups and in meeting occasional local medical needs (Jian 2001: 85).

Since the 1960's, global aid organizations have invested over \$170 million of aid in order to improve development in Northern Thailand (McCaskill and Kampe 1997: 23). These efforts were primarily linked by Western donors to decreasing the production of opium, in effect, defining "development" as a cash-income replacement activity. Communities that previously had little or no contact with outside groups were now in constant communication with aid agencies based in countries half a world away, and the impact was visible. Programs trying to increase development efforts in

Thailand strongly focused on the agricultural development of non-opium crops as their main instrument through which economic expansion could occur. This economic expansion was primarily done, thus, to stem the growth of opium production in the rural communities, which was very commonly supporting the government and donor defined “communist movement” across eastern Asia. As opium resulted in supplementing income when rice and corn were not enough, aid agencies believed that they needed to introduce another cash crop in order to convince people that a change to something more western-friendly would be economically beneficial (Jian 1997: 85). The USDA’s alternative crops project initiated the change in the 1970’s and 80’s with assistance from the Thai government, the UN, the Norwegian Church, the German government, and several other European development agencies. The objectives of this project were to donate corn seed, provide basic technical experience, and to help market the products for farmers (Jian 2001: 85) The project took place in an overall context that included the Vietnam War and other cold-war related activities that defined USAID and other Western activities as having to ultimately achieve larger anti-Communist geopolitical goals.

Trials with animal-feed, hard corn showed the crop to be successful as an alternative in the ecological climate, and in several years, the broad acceptance of and production of the crop resulted in Thailand’s experiencing an economic boom in producing it for the global economy (Jian 2001:85) Participation in this change by Greenhill’s farmers had huge implications for the community. The financial rewards

and appearance of higher security related to food from the move from subsistence-based growing systems to cash cropping encouraged many to mono-crop, to only grow one single crop. People believed they were more likely to increase their economic income by planting the one single crop, and stopped the process of interplanting for fear that it might lower their cash income (Jian 2001:87). This was a legitimate concern, as corn production now accounted for 80% of a family's income. A similar process happened with the use of Litchi trees in the village and in related projects in Northern Thailand, and now litchi orchards cover $\frac{1}{4}$ of the arable land in the village. Subsistence agriculture has been all but abandoned, with just a couple rice paddies and banana fields visible in the area (Jian 2001: 87).

The benefits of this type of system as seen by the local people are the increase in cash return and, ultimately, access to new technologies and systems to maintain this type of agriculture that were previously unaffordable. Initially, this type of agricultural growth encouraged an increase in productivity per unit of land, and people were now able to assume a greater level of food security for both themselves and their families due to the sheer amounts of corn being produced. While the apparent increase in food security had offered many families a new level of comfort, others found it to be undesirable. One woman noted that in the time before USDA had begun this development program, she had had access to a wider variety of foods and her work load was light. With the promotion of monocropping, however, her family subsisted primarily off corn, and had to buy other vegetables that she had been able to get for

free before the program (Jian 2001: 87). This type of shift to a less varied diet is common in communities who change from subsistence based agriculture to an economically based system, but villages who partake in this are often ill equipped to respond to these changes on their own (Jian 2001: 87).

Monoculture also carries with it a huge risk of crop failure, ultimately resulting in huge economic loss if the crop fails one year for some reason (see Kottak 2009, Moran 2000). The previous strategy of inter-planting fields minimizes the risk by carrying with it significant benefits in the maintenance of soil structure and the minimization of weeds and pest problems. Monocropping creates “pure-stand” fields that maximize the production of a single crop, while increasing problems associated with fertility and pests. If these problems are addressed, labor and capital investment costs significantly increased. If they are not, yields under tropical conditions tend to consistently go down (see Netting 1993 and Kottak 2009).

An additional effect caused by the USDA program that has inadvertently caused damage concerns pig culturing in Greenhill. Prior to the program, the local pigs that were raised by most farmers had lived off a fairly wide range of recycled foods coming from the leftovers and rotten parts of meals that the villagers commonly ate. With the change to cash-cropping, people had a decreased variety of food to feed their pigs, and also were reluctant to share corn with them as this sharing would contribute to a loss in monthly income. Households that used to support eight or nine pigs maintain only two or three currently, which is not enough to meet the protein

needs of the families in the village. In addition to the decrease in quality of diet amongst villagers, the declining pig population means that free fertilizer that the pig manure constituted is now greatly decreased, and people must spend more of the money they have earned from their cash crops in order to produce enough to meet their families' productivity and food needs (Jian 2001: 86; Kottak 2009).

The RHDP program in this instance offered mixed results. The people in Greenhill had significantly increased access to a global market, enabling them to sell their crops and increase their financial means. In doing so, however, their nutritional intake suffered greatly, and the people were at a much higher risk for crop failure. There are two aspects of this case that are especially relevant to the theories discussed in Ch. 3. The first is that the community was not involved in any type of discussion about the need for this project. It is clear that the trade-offs of increasing financial intake through mono-cropping were not discussed with the farmers, the local decision makers. Therefore they could not take nor were they in a position to negotiate with the donors' preventative measures to mitigate or eliminate these problems. The second issue is that there were no mechanisms built into the program design to deal with these nutritional and other problems as they arose, and consequently, Greenhill is now at very high risk for crop failure, which would ultimately result in economic failure, and starvation, of an entire town. Because of the lack of evaluation and frameworks for two-way communication between the community and the organizations to discuss

local needs and wants, Greenhill faces significant problems in survival in the future that may not be easily fixed with local adaptive strategies.

Papua New Guinea

Development in Papua New Guinea (PNG) was initially determined and run by a branch of the World Bank. The goals in this case were to develop strategies to create and/or increase economic development amongst rural populations within the country, who survived primarily off of subsistence farming and local economic systems. Similar to the case in Thailand, the community was not involved in problem definition or the creation of the new adaptive strategies defined by the World Bank to help deal with the problems identified by the Bank. Furthermore, the case involved huge amounts of “charitable” [read: aggressive] giving on the part of the World Bank to the people of PNG, contributing to the already uncomfortable relationship between the two parties. Ultimately, few aspects of this project were used as they were meant to be used, and communities only began to respond positively to changes implemented by outside groups when they involved aspects similar to existing local mechanisms of adaptation.

The case in Papua New Guinea (PNG) occurred roughly around the time that the country gained its independence from Australia in 1975 (Cochrane 2009: 71). Aid administrators from the World Bank had attempted several projects as early as the mid 1960’s, all of which revolved around increasing monetary wealth within the country.

At this time, there were three major economic sectors in PNG, including 1) traditional horticulture, upon which the majority of the PNG population relied, 2) a slow growing monetized sector, directed primarily by expatriates and revolving around plantation agriculture, small-scale manufacturing, foresting, and other government initiatives, and 3) a large mining co-operative that had very little overall effect on the PNG economy in terms of employment and income (Cochrane 2009: 71). This meant that most people in PNG were subsisting off non-monetary systems that relied heavily on local systems of kinship and reciprocity to meet their energy needs.

This is a significant example of ignoring the realities of data and pre-defining development problems by an external development agency. By 1975, the highland majority communities gained the bulk of their cash income from male migration to coastal plantations, including consequent alcoholism, peonage, and patterned gambling as a form of investment (Sillitoe, P, Stewart, P, & Strathern, A, 2002). Subsistence cropping continued in the highlands, primarily involving labor-intensive farming of ridged fields, but in most areas it was also mixed with extremely labor-intensive small-scale coffee production for cash. These latter highland systems were primarily run by women in their 15-45 year old age periods whose brothers and husbands were often gone for periods of up to two years cycles. The money the men sent and brought home was already dramatically changing highland communities by 1975 into high consumption communities (from stores and traveling traders) that had a decreased access to both food and energy in the form of labor. And men, not women, had

learned pidgin English which they used to communicate with government and economic agents from outside the highlands, primarily plugging men into the national economy and benefitting them when new development took place. The total effect was the weakening of kinship and big man systems as a basis of organization by 1975 (Golub 2007: 42; Sillitoe, P, Stewart, P, & Strathern, A, 2002).

There was, however, a determination by the WB after statistical census data was analyzed that PNG was in need of substantial economic developmental aid, and that, according to global indicators of poverty, the Bank could offer the funds and knowledge through which PNG could achieve a significant improvement in those indicators. These data were used to divide the population into two groups: those who lived above the “absolute poverty line” and those who lived below it. This line was determined by the World Bank as a packaged amount of goods, including basic shelter and food needs required in order to keep an individual and family alive. The amount of food a body needed was based on assumptions made by officials about the amount needed to support the body’s metabolic rates at rest, ignoring the issue of labor-intensive production in both the coastal areas and the highlands (Cochrane 2009:69). Instead, programs were designed around determining the economic growth needed for families to move above poverty line.

To achieve the objectives of the World Bank and non-local NPG government officials, the newly-independent administration was advised to focus on development in coastal regions, a process which would include the adoption of industrialized forms

of land management. These projects were designed to mainly affect expatriates and expatriate wealth, and therefore, there was little discussion between World Bank officials and local populations, including those from communities sending workers to the existing coastal systems, in terms of program design. The assumption was that growth of monetary income amongst the expatriates would stimulate economic processes within the country and thus, “trickle down” to the local community members. In the process of implementing this project, certain initiatives immediately targeted the local coastal populations, but these were largely unsuccessful as the local populations refused to participate in many of the development efforts (Cochrane 2009: 72). This non-participation was due most likely the result of an absence or near absence of communication between those local populations and those designing and implementing programs invented to benefit them. Decisions about projects and program design were made primarily in Washington D.C. (Cochrane 2009: 73) where little communication could take place between community members and development officials regarding perceptions of wants, need, and success. Members were not consulted during the subsequent projects that occurred, and the result of this was that local and community processes were assigned western values and ideals that did not match local conceptions of community organization, poverty and need.

Specifically, local political processes and leaders were ignored, and non-local leaders given power over groups of people incorrectly labeled as “chiefdoms.” This was an inaccurate definition of the Papua New Guinea societies involved, as they were

politically organized as tribes. The perception, in turn, revolved very closely around the authority of “big men,” who gained political support across villages through strategic extreme generosity and strategic political actions. These men (occasionally “big women”) tended to encourage their village members to share the wealth that they had to promote the overall good of the community (Cochrane 2009: 70). This system therefore, was founded as a redistributive political system “based on face-to-face interaction between leaders and followers and on the careful accounting of contributions and redistribution” (Cochrane 2009: 70). Non-local leaders, therefore, held no authority within villages and, thus, had no local support for the projects they implemented. World Bank officials, however, tended to ignore the fact that both they and their advice were often unwanted. They considered their counsel to be more advanced than that of the elected local leaders within the country, and thus pushed loans and development programs onto the local populations, earning them the name “loan salesmen” by the elected officials.

One program dictated by the “loan salesman” was designed around developing a livestock program in which the Papua New Guineans would be given cattle and pig herds to raise on the interior highlands that were misunderstood by the World Bank personnel as being “spacious” and underutilized (see Cochrane 2009). The PNG officials accepted the loan for the project primarily out of politeness in an attempt not to offend the officials from the World Bank, and soon, many families were given both cattle and pigs to raise. Beyond the longer term impact on the highland valleys that

included both overgrazing and deforestation, more immediate problems arose when the community members demonstrated an intense fear of the cattle themselves, and began to stalk them with axes and guns. Worse than their fear of the cattle was their disdain for the pigs they had been given. This specific breed of pig was known in Denmark for its lean quality of meat, something that was highly prized in Europe at the time. In spite of the strong cultural focus on pig culture as part of the adaptation in the highlands, the local people disdained the pigs provided to them by the program. The villagers did not like the taste of the new pork, instead preferring a fatter meat than the lean bacon provided by the European pigs. Furthermore, the pigs suffered sunburn and required more care than local species. Perhaps the most difficult part of the project, however, was the fences included to keep herds on the owners' property. Papua New Guinea social structure in many Highland valleys was founded on principles of egalitarianism, and tribal processes dictated that land was not specifically owned by one individual. The fences proved to be quite disastrous socially and politically, in the sense that they wasted money and created tensions and conflicts because they did not accommodate the local structures of ownership. The few expatriates that participated in the development effort, however, perceived coastal and Highland programs to be quite wonderful, and the development aid ultimately ended up increasing the inequality between the coastal ex-patriots and the Highland people (Cochrane 2009: 74).

The local populace responded very negatively to outside aid, as it did not include local conceptions of want, need, and success. The externally defined projects only succeeded in taking authority away from local leaders and creating greater inequality between the local and non-local populations. Development work, in this instance, only succeeded in “underdeveloping” the area that it was meant to help most. Aid programs had a completely different reception in the same area, however, when they took into account local conceptions of need and benefits. It was not until PNG gained independence from the Australian government that serious civil society reform began to take place.

Formerly, the civil service in PNG (run by the Australian government) had not delegated major responsibilities to the local levels of government, and consequently, there was little local participation from the PNG people as many of the programs revolved around Australian definitions of development, want, and need. When civil society reform came into a new stage after the parting of the Australian government, local culture informed the development of new public service to be responsive to their village ties and local rules about social responsibility and exchange. The first stage of this reform was instituted before the end of colonialism---in 1965. Local development councils were funded by the national government to identify and carry out projects. After independence in 1975, they continued to exist but, in essence, lost funding. Big men and their linkages to legislators in the capital became the main system for identifying development problems, designing projects, and for implementing them.

Social hierarchy was specifically important in this instance, as the local people were used to a system with high flexibility and movement between positions, something that closely mirrored the big man system (Cochrane 2009: 80). Positions, therefore, could not be stagnant within civil society positions, as the operation of big men within society was one that responded to immediate societal concerns and subtle changes of authority within the community. In order to accommodate this, public service development had to change from the standard single bureau with eleven top positions to multiple bureaus with ties to certain tribal affiliations and connections to home villages of such people. In cases where this was implemented, the elected officials were much more aware of the process that governed specific actions and logic processes within communities, and therefore were much more adept at responding to the concerns of the community. While this did not transfer directly to the economic development of the country as a whole, it allowed individual response to locally determined problems, and was widely accepted by the PNG people as a legitimate problem solving faction within the government (Cochrane 2009: 81).

India

The NGO working in India approached issues of development from a completely different perspective than the previous two cases discussed. Instead of dictating specific external prescriptions for what the organization thought would be useful, the NGO approached the community with the goal of simply helping with

HIV/AIDS prevention. Through discussions with groups and individuals, they gained an understanding of the scope of the problem, as well as local perceptions and realities surrounding issues of sex, drugs, and disease. Through these conversations, they were able to develop several locally based programs that took into account these local ideals, which ultimately resulted in a long-term and successful relationship between the NGO and local people.

In 1990, the Ford Foundation funded a program in Southeast Asia to investigate reproductive health issues so that better services could be offered to those who lacked access to regular health care (Pelto 2002: 189). The directly applied focus of the program initially showed that reproductive health issues were of interest to the intended beneficiaries, but in a way that was not initially perceived by the NGO themselves. After much field research was conducted, the information that resulted from feedback indicated that AIDS was a much bigger concern than reproductive health issues for the people in the communities. The NGO then shifted its goals to work with concepts of safe sex through understanding general practices in the community (Pelto 2002: 190). Their research was based on qualitative methods, and included interviews, social mapping, and informal conversations with community members. The process of “social mapping” is what enabled the NGO to gain the rapport of the community and adapt their program to best fit the needs of the individuals (Pelto 2002: 193). On the basis of this case material, Pelto notes the importance not only of gaining trust from the community, but also understanding their

“scripts” of behavior under certain circumstances (Pelto 2002: 192). A script, in this sense, involves the expectation of a certain action or response in a given social setting. Under these circumstances, people are expected to act and respond in a very specific manner, and so the goal of the NGO was to find a way either to include HIV/AIDS prevention in these scripts or to find a way around them to ensure people were acting in a safe and preventative manner. The general taboo on discussing sex in this culture makes understanding these constructions by the NGO much more difficult, and ultimately determined a need for long term research on the population (Pelto 2002: 193, Pisani 2008: 62).

In this Indian case, the methodology of such research in NGO work is based strongly on qualitative methods, as it is claimed that the results are more instructive in the social processes than other more generalized statistical measures of sampling (Pelto 2002: 189). This specific case involved the use of social mapping, in-depth case interviews, free listing techniques, and several small quantitative studies. Through group and individual interviews, researchers discovered that people were not as concerned about reproductive issues as the problems associated with the cultural stigmas of sex and diseases related to sex. In such forums, individuals expressed anxiety over topics such as abortion and semen-loss, even though researchers had not been instructed to ask about them or had even been aware that these were topics tied with apprehension and worry. More than anything, it indicated a need for sex

education, which could address the concerns of the individuals while still promoting practices to increase the safety of individuals engaged in such practices.

Training sites and workshops were determined through an examination of the data received, and were set up to take place in the places where the research had taken place initially (Pelto 2002: 195). This made it more likely that the groups of people who had participated originally would be able to access the services that had been designed, ultimately, from the original information they had provided. This meant that instead of holding one large follow-up workshop, multiple small-scale programs (locally-based workshops on HIV/AIDS prevention) took place, each taking into account the stigmas and issues that were specific to each region.

In this case specifically, the most important aspect is the NGO's immediate productive response to local concerns and perceptions of problems. This could not have been accomplished without ethnographic fieldwork taking place before implementation or without the feedback mechanisms embedded within the program itself. There is a strong indication that these were done as well as possible because the program goals changed from working with reproductive health to HIV/AIDS, which was clearly indicated by the local people as a more important issue. The inclusion of these feedback methods ultimately enabled the NGO to create a long-term relationship with the community built on trust and commitment, and therefore long-term change was much more likely to occur after their ten years of work.

Indonesia

Pisani's work in South-east Asia is perhaps one of the most illustrative of the value of feedback loops and related community involvement in establishing a basis for creating and implementing projects that are regarded by local populations as meaningful and effective (Pisani 2008: 61). The feedback and local involvement created for the NGO involved a productive understanding of cultural factors that affect the spread of HIV/AIDS. The primary goal of developing an understanding of these factors was to identify ways in which local people can best prevent the spread of HIV, and included work in areas that primarily dealt with sex workers, drug users, and polygamous societies. One of the primary issues Pisani faced was dealing with concepts of gender and sexual orientation with people, who under western cultures, would be limited to specific categories, such as man, gay, etc. The fluidity of gender perceptions determined by the culture of the country in which she worked, however, demonstrated that the approach to prevention could not be limited by western constructions of gender roles (Pisani 2008: 87). In the case of Indonesia, the primary at-risk population was a group of men called *waria*, who sold sex to other men but were considered culturally to be women. Most of the people engaged with the *waria* had wives, and most of the *waria* themselves had boyfriends, meaning that their infections were very likely to spread to the general population through sexual contact. Information about *waria*, however, was completely ignored initially by the

government, thus ultimately hurting the chances of preventing an outbreak among this population (Pisani 2008: 1987).

The goal of Pisani's work, in conjunction with work by other local NGOs, was to understand the way that sex workers and drug users interacted with each other and those outside the *waria* category, so that prevention programs could be designed to target those to whom HIV was the greatest threat. This included research programs that included many different approaches to gaining rapport with the sex worker and drug user community, such as using peers, women, men, clients, and various others to determine and understand the social factors which determined the way that people lived their lives. Researchers had to be trained to be as non-judgmental as possible, for in a topic as taboo as sex and gender fluidity, expressed judgments could discourage certain groups from continuing conversation with the NGO. Pisani's group also quickly learned to suspend research before upcoming elections, as many politicians would use this time to tighten the rules regarding prostitution, and raids that were common in country became attributed to her group. In suspending their research around these times, they were able to maintain a level of trust with the group so that their research could continue to include very quick and informative feedback loops amongst those who mattered most to the success of the project (Pisani 2008: see chapter three).

Ultimately, the people being studied were not concerned about the long-term health effects related to their trades and habits (Pisani 2008: 95). Drug addicts

continued to use drugs, prostitutes continued to have sex for money. The difficulty researchers faced was that the immediate payoffs (e.g. money, a high, etc.) for engaging in such activities were far more appealing than the long term payoff of having good health. The feedback from interviews suggested that this was not something that was going to change in the near future. So instead of their original plan, Pisani's group focused on encouraging safer ways to engage in such risky behavior, such as handing out clean needles or condoms (Pisani 2008: 99). While this methodology can be highly controversial, Pisani's group found that people were more willing to take what they saw as easy steps to fix these short term problems (Pisani 2008: 99). This would work initially to increase prevention while policy change could come after more data had been successfully gathered.

The case in Indonesia strongly mirrors the case in India, where communication and community definition of problems were included in the program design from the beginning. These two NGO groups worked to first understand problems on a local level before even beginning to explore solutions to issues with which they had no prior experience. Through these long-term studies, cultural issues that were very well concealed became apparent, and changed the nature of the response to aid itself. Using ethnographic research with feedback methods and communication with marginalized groups within the community in these two cases ultimately resulted in the NGO helping to create adaptive strategies that the people saw as valid and

beneficial, and acted as a long-term strategy to deal with a problem not easily solved by local solutions.

Honduras

The final case occurs in a small village in Terreritos, Honduras, and is an example of a small-scale project sponsored by the University of Pennsylvania chapter Engineers Without Borders. Most important within the context of this research is the focus on the local innovations of the project to fit long-term goals of maintaining a safe water source. The project was initially a response to a need for new adaptive strategy to a project that the community had begun in 1995 to help supplement their water needs. As the community defined their own need and projected their own solutions, Engineers Without Borders-UPENN was able to act under local contexts in response to the lack of resources and knowledge of large scale water distribution systems.

The growth of the village of Terreritos in the early 1990's required change in the existing strategies revolving around water access. The village was home to approximately 225 inhabitants, about a third of whom lacked access to enough water to maintain their fields and families (EWB-UPENN Technical Report 2006: 1). While the village's 25 households initially were able to get enough water from local wells and small streams, the growth within the community to 46 households made the current system unsustainable (EWB-UPENN Technical Report 2006: 1). In 1995, water was

routed from a local stream to produce more water (at 2.5 gallons/minute), but this too proved to be unsustainable with the growing needs of the community. In response to this problem, the community collectively bought a plot of land containing a water spring approximately five kilometers from the village. Engineers Without Borders-UPENN chapter became involved with the project in 2005 to help create a distribution system for the new source of water.

EWB-PENN took three trips in order to develop and implement this project. The group partnered with a local NGO called Fundacion Cosecha Sostenible (FUCOHSO) whose goal was to provide small agricultural communities with the resources to adopt sustainable farming practices. The group followed similar practices to the EWB-UD group (to be discussed later in the chapter), and took an assessment trip in January of 2006. On this trip, EWB-UPENN established a strong working relationship with community leaders, conducted baseline health surveys, and carried out preliminary water testing (EWB-UPENN Technical Report 2006: 2). The second trip involved implementation of the distribution system, which also included mechanisms for ensuring water purity. Villagers were provided with health information and small skits regarding the maintenance of water purity in a distribution system. While extensive use of chemicals was not necessary, villagers were encouraged to keep water clean by keeping their animals away from the water source and not washing clothes in the water source (EWB-UPENN Technical Report 2006: 3). The third trip acted as a post-implementation trip to follow up on activities that

had not been completed on the previous trip, and to evaluate local maintenance of the system. Currently, the group is working with the village to develop pit latrines to ensure that the quality of the water remains uncompromised by human waste.

Throughout the project, EWB-UPENN was heavily involved in community affairs and activities to create systems of rapport in the short time available. Villagers contributed both to resources for the project and physical labor, demonstrating their investment in the success of the project. During assessment and implementation trips, they held meetings at the local schoolhouse with the community to allow for input from all interested community members in the planning (EWB-UPENN Technical Report 2006: 11). During these meetings, a water committee was established to oversee collection of dues and execution of regular maintenance for the system.

The significance of this project lies in the community's definitions of the problems the EWB group faced. Because the community had such a strong investment in the project from the beginning, the system faced a much higher probability of being accepted as a legitimate change in adaptive strategy. In this instance, the NGO acted primarily as an intermediary between the village and outlying resources, and the consequence of this is a sustainable exchange of technological adaptive strategy.

Primary Data: University of Delaware EWB Potable Water Project in Cameroon

This case is an example of a small-scale NGO project to provide potable water to a community. It was one that began with the UD EWB's approaching a town in Cameroon, Bamendjou, with a category of activity intended to address general potable water problems identified by local authorities there (see image 4:1; Bafousam). The case specifically illustrates a more-open-ended approach on the part of the NGO to the development of project design and implementation by members of the intended beneficiary population. This, in turn, can be seen to create the basis of a major contribution by indigenous management.

In countries throughout Africa, potable water access has become an increasingly complex issue that has generally required the use of non-indigenous technologies (Fonjong 2003: 430). Most countries today lack the essential infrastructure to ensure water access to individuals throughout the rural sector, and therefore this task has very often fallen to aid agencies and other international organizations. In Cameroon, specifically, in the Northwest province, the majority of people subsist on agriculture, and labor migration is fairly high due to the difficult socio-economic environment, and the absence of local jobs and basic social amenities. Presently, only 40% of the rural population has access to potable water, and of these systems, only 60% are operational (Fonjong 2003: 430). These water systems are subject to the effects of drought, which happens frequently during the dry season, and irregular precipitation makes it difficult to predict how to portion out water. Recently,

Cameroon has seen an increase in its need for water, as have Morocco, Algeria and Tunisia, as a result of rapid economic activities and population growth (Fonjong 2003: 430, Thukam 2006). In an attempt to accommodate this growth, different communities are exploring new systems of water access and management.

Several donor agencies responded quickly to the problem of water access in Africa immediately following the 1974 Sahelian drought, in which both crops and livestock died due to lack of water (Fonjong 2003: 430). The response from aid agencies was to dig deep “tube” wells within the communities hit hardest by the effects of the drought. Some were used, and helped remedy the problem immediately. Others, due to socio-economic constraints of local politics, were never used, and instead just rotted away from the lack of care. People were not trained in maintenance, and there was no discussion with the communities about who was responsible for the care of the well, something particularly difficult in communities that had highly individualized family-based (as opposed to community based) systems of farm and other facility maintenance. Community members felt that they did not need to care for the community systems, since they came to them as a free gift, and therefore the “solution” to the water problem only succeeded in creating tension between the organization that had implemented them and the community. These systems did not in fact solve any problems, and in a sense, simply left a visual reminder of the lack of help received from the outside organization (Fonjong and Fonchinchong 2004: 433).

The International Water and Sanitation Center (IRC) offers a different approach to solving the problem of potable water access around the world (Fonjong 2003: 436). Their process revolves around enhancing the capacity of the community to manage its own water system. Perhaps most important in this concept is that people are no longer perceived by the agency as acting as passive receivers of goods, but now begin to act as involved participants in determining the processes and development of a new water system. Each community, consequently, develops its own unique system. Overseeing this system is often a local committee formed within each community which determines those who care for it, an organization that potentially can adjust to differences in the structures for maintenance. While this committee does a good job of including community participation, it often does not include marginalized individuals within the village or city. In order to counter this, the IRC works to include in special focus groups both men and women, as well as different non-voluntary associations. This includes those in particular age brackets or kin organizations, and ultimately acts to ensure that one party cannot manipulate the system to its favor. Further action includes training women to maintain the system, since they have the greatest stake in the success of the project and in instances in Cameroon where this has been pursued have proven to be incredibly successful in maintaining the efficacy of systems (Fonjong 2003: 438)

Engineers Without Borders

Engineers Without Borders- USA (EWB-USA) is a national NGO with local chapters in individual schools around the country. The organization was founded in 2000 by a group of students at Colorado University (Engineers Without Borders Website 2009). In the past nine years, over one hundred and eighty universities and colleges have begun sponsoring programs in villages around the world that aim to create sustainable solutions to problems revolving around water sanitation, renewable energy, and other miscellaneous projects. In addition to the mission of sustainable and community driven solutions, the vision for the projects is stated as “a world in which all communities have the capacity to meet their basic human needs” (Engineers Without Borders Website 2009). In order to accomplish this goal, the student based organizations receive the support of the engineering department within each college and university as well as the Service Learning department. Each of the EWB-USA chapters is required to maintain a five year commitment to the village with whom they work in an attempt to ensure community involvement and ownership. In addition to their long term commitment to communities, their mission statement indicates a strong desire to work *with* these communities to design and implement projects, and ultimately in fostering a partnership between the village and project team. EWB groups are approached by villages facing certain engineering problems in the previously mentioned issues and are then required to conduct a community needs assessment trip at the onset of the new project. EWB-USA states that these trips “are

essential for project teams to begin to understand the needs of a community and for the community to begin to know the project team” (Engineers Without Borders Website 2009). The goal of the organization is primarily to foster responsible leadership on the part of the engineering students and secondly to work with communities to create sustainable solutions to the problems within the communities.

My research was focused on the program in Cameroon that included the Engineers Without Borders chapter at University of Delaware. This NGO branch was started by a small group of students in 2006 with the support of the Engineering College and the Office of Service Learning. The group’s goals are as follows: to develop and foster long-term relationships with an international developing community and to help establish the necessary infrastructure to administer and maintain a sustainable solution; to provide students with technical and cultural knowledge to effectively approach and solve world problems on a community-based level; to promote world citizenship in helping to achieve the United Nations Millennium Development Goals of 2015, which include reducing the number of people without clean water and sanitation by half; and to provide students with a multi-disciplinary international network of students, professors and professionals dedicated to the betterment of society. The group currently runs programs in Cameroon (starting in June 2007) and Guatemala (proposed August 2009). The discussion below maintains a focus on the Cameroon initiative, although some data

will be pulled from meetings with students and faculty involved in the Guatemala project as well.

The Cameroon project began with support and information from Olivia Mukam, a student at Johns Hopkins University and the daughter of the mayor of Bamendjou, Cameroon, regarding the need for better water access and potable water in the region. There, the responsibility for obtaining water falls to the women and children, who, at times, must walk up to three kilometers to reach a water source. Often, the water that they do get is turbid and filled with bacteria (Engineers Without Borders, University of Delaware: 2008; Thukam 2006; Zinc 2003). It is estimated by the community members that waterborne disease accounts for almost half the deaths within the community, a belief supported by the doctor at the local hospital. The UDEWB made contact with Emmanuel Mukam, the mayor, who suggested that he thought the best solution to the town's water problems was a water distribution system powered by solar energy within the village.

The team made two trips to the area over six months to develop both an engineering assessment and community support for the program. Part of these assessments involved the formation of a local water committee (to be discussed in greater detail below) and the use of a decisions matrices (see table 4:1 in Apendix) to determine the sustainability of and community engagement with specific project options. In addition to these decision matrixes, the members of EWB, including the faculty advisor, spent a great deal of time meeting with important community leaders

and officials to discuss the problems of water access and sanitation as the local people defined them. This included separate meetings with the chief of Bakang, the King of Bamendjou (an inherited position), the Mayor of Bamendjou (an elected position), and the gendarmerie. They also met individually with other community members, including children. The NGO also wanted to include women equally in the development phase of this project, since they would be affected most directly by the outcome, but it faced difficulty in finding a forum through which to pursue this goal.

Community Ownership and Involvement: Nura and the Water Committee

Cameroon, and the Bamendjou region specifically, had previously had an experience with a non-local NGO that the members of the community defined as grossly unpleasant. The data is particularly helpful in understanding the historical “development” context in which the EWB was working (and continues to work) and in providing a view of an NGO’s approach that was the opposite of that of the EWB to a water project. The specific NGO was Scanwater, whose stated mission revolved around improving water access and sanitation around the world (Fonjong and Fonchingong 2004). Their approach involved installing large-scale water towers and cleaning systems in areas that have limited access to potable water. The extent of community involvement was the NGO telling the villagers what the NGO planned to do to fix the problem (also defined by the NGO) and there was no discussion of what maintenance would be needed after they left. In Cameroon alone, Scanwater put into

operation over 300 systems throughout the country. In a little less than twenty years, less than five are still in operation (Fonjong and Fonchingong 2004). The maintenance problems with the water system were not technically related, which can sometimes be the case.

Instead, in this instance in Bakang (and, according to my research informants), the issues with the system were directly related to the lack of community maintenance of the project. The Scanwater project required some monetary investment by the village in which it was implemented, as it ran on a diesel pump. There is little centralization of funds in this part of the country as the community relies heavily on subsistence based agriculture, which makes up roughly 45% of the GDP in Cameroon. Families also keep small chickens, goats, and even cattle at times to help supplement their diet. Furthermore, villagers often buy and sell extra crops and foods in local markets to increase cash flow and increase variety in their diets, which means that expenditures are determined primarily by immediate needs revolving around food. People not only were unwilling to contribute money to keep the pump going, but several months after it stopped working, community members started stealing the pump parts for other uses around the village. The Euro-centric nature of the project wrongly assumed two things: firstly, that there was a public fee system set up within the country, and secondly, that water collection was a public and shared affair. This generally western approach, however, did not take into account the social realities of water collection outside of the United States. In Bamendjou, water is collected for

individual families by women and children according to village location and therefore, is not a centralized activity.

The UDEWB worked with the community to create the water committee on the first trip in an attempt to avoid the problems that Scanwater had faced with its conceptions of community ownership and system maintenance, and, in an attempt to include the range of water users, it was intended that it include an equal number of men and women. The composition of the group was initially decided by the chief, who is the self-proclaimed head of the committee. The committee met as needed to discuss problems with the system and, also, when the implementation team arrives to discuss the goals of both parties on the trip. There is a very strict social protocol followed by the community and implementation team in these meetings that recognizes the authority of both the chief and the faculty advisor of the EWB-UD team within a public forum. While the team sometimes makes mistakes in following these processes, their deference to the protocol and community members gives them an equal footing with the chief within the public arena. In turn, the chief and faculty director discuss their goals and objectives for the trip and the manner through which they hope to achieve these. After the broad issues are addressed, issues of a more personal nature (payment, problems with the system) are addressed and solutions discussed.

Because the students cannot be in Cameroon year round, they make use of both the water committee and other local members for cultural assistance and basic

evaluation of project acceptance among the community. Among these local resources is a Peace Corps volunteer named Nura, who has lived in Cameroon for close to eighteen months, and Peter, a Cameroonian man who runs an NGO in the northern part of the country that deals with issues of potable water. Nura was a unique member of the Bakang community, having been there a full year in January. Over her time spent in the village, she had gained strong authority with community members, which enabled her to attend and even speak in forums where women usually were not allowed. Her relationship with the community was one surrounded by trust and patience, and she had gained a significant cultural knowledge about the community through the time she had spent there. Peter Njodeka, a local man, ran and operated an NGO in the northern part of Cameroon working with similar technologies that EWB used to alleviate problems of water sanitation. Nura and Peter have insights into local cultural mechanisms that are often not apparent in the three weeks long visits that the implementation team makes in the country. These contacts often offer culturally relevant solutions for the team to consider so that the team can propose projects that include the local perceptions of need, benefits, and success. The implementation team met with the water committee twice on the January, 2009, implementation trip. The first meeting took place at the chief's house and included mostly men, with Nura (the Peace Corps volunteer) and myself as the only attending women. Because she was able to understand subtle manipulations of language and cultural aspects that EWB members did not grasp, she was an invaluable asset in exploring the interactions of

technologies that EWB had not had time or had been unable to do. This included explaining filter operation and maintenance in metaphorical terms, as well as advocating for the women to be on the committee. At this meeting, Nura used a metaphor about caring for a goat to explain the pricing system for the filters, justifying the need for families to have a monetary investment in the project. The water committee was given the responsibility of deciding an appropriate price for the filters, and EWB agreed to subsidize the rest of the cost. It was at this time that the villagers proposed that Bakang act as a sister city to Newark (DE) in an attempt to ensure a long term relationship with the engineering team.

The second meeting took place in a more public forum (the town square) and initially included only men. Because of its public location, however, women passing by had no qualms about joining the meeting, and gradually, the amount of women overtook the number of men. The same protocol for speaking was followed again by the chief and the faculty advisor, who had brought along a native Cameroonian to help explain in more local terms the developments made within the project. Peter was able to describe how the filters worked much like Nura had done, basing it on metaphor and local knowledge systems. He also encouraged the women who had arrived to voice their concerns with the project, as their opinion was crucial in the overall success and sustainability of the project. The women responded by dancing and singing about the importance of water in life, and expressed their joy in having their opinions heard in their native language, which was then translated by the chief. It was at this meeting

that the initial price for filters was announced, which was at 5,000 CFA a family, or ten American dollars. This was significantly more than expected, but every family present at the meeting signed up to receive a filter at the end of the meeting. At the present time, over 30,000 CFA have been collected for the filters, and four have been built.

Community Ownership and Involvement: Protecting Projects and Advocating New Ones

One of the most significant problems that the Scanwater project faced was a lack of maintenance from local populations of the system, which is ultimately what caused it to break down over time. The EWB-UD team was very much concerned that it not repeat those errors. The community involvement in maintaining programs in the time that the EWB team is not in country, therefore, has become a clear non-verbal indicator to the UDEWB of the value of the project to the local community members and the related extent of the project's effectiveness. While the villagers were able to express their opinions of the project and the actions of EWB verbally, there were other important visual and social indicators that revealed mixed results. The solar system that had been put in by UDEWB six months earlier had been well maintained. Not only was the system in perfect working order, but the water committee had commissioned community members to build a fence around the water tanks and the solar panels to protect them from cars, goats, and children (see image 4:2 and 4:3). Furthermore, the system itself was used to full capacity every day, both by children

and adults getting water, and there was an hour every morning when there was no water in either tank. Across from the tanks and solar panels were two small stores run by women, who often watched over the tanks to make sure the kids were not playing on them. When there was an instance where the tap was broken, they contacted the water committee, who then raised the funds required to fix it. The only part of the system that was not well cared for were the solar panels themselves. While they were protected by the fence, the panels themselves were incredibly dirty, and the data logger revealed they were only giving thirty percent of their expected output. However, because both the tanks were filling everyday above capacity, the people saw no reason to clean them. The panels remained dirty, even after local people were advised to clean them.

In contrast, the filter project received the opposite treatment of that given to the solar project. When the EWB team arrived in January, 2009, the filters they had built six months earlier were sitting unused in the same spot where they had left them, and now two of them were broken. The team had known this before arriving, but still wanted answers as to why these were not being used. Common community responses were that they were too big, too expensive, and that the women did not understand the value of having such filters. The local doctor believed that the people were too stubborn to think that the filters were worth the time that they took (they run a five gallon bucket in one hour), and that the people were generally undeterred by the fact that the water was dirty as they had been drinking it for years. Nura suggested that

putting the filters in a more local [public] place (e.g. the school, the hospital, the health center) and including children in the building process might help people become more used to them and to begin to associate them with overall health. EWB immediately responded to these concerns by making the filter much smaller, subsidizing the cost of materials, and putting filters at the hospital. They also asked Peter and Nura to help advocate for the filters in more locally relevant terms. As of now, however, the people who signed up for filters have still not received them and EWB is looking to investigate this problem in their next trip.

EWB Reactions to the Community: Perceptions and Thoughts about the Project

One of the most significant issues within program development is creating an understanding of the adaptive processes that occur within specific ecological contexts. If communities are perceived by an outside aid agency as lazy or ungracious, serious problems in program design occur and the project no longer can act as an adaptation to local problems, as local perceptions and beliefs are no longer being included in the implementation. In investigating general perceptions of the EWB group, it becomes apparent whether or not certain perceptions of the local population are creating long-term and culturally legitimate solutions to the local problems.

General perceptions on the part of EWB-UD participants of the community tend to be positive ones. However, those views are held by a cross-culturally inexperienced population of undergraduate American students. As appears to be

typical of the NGO's members, most students in the January, 2009, group had not travelled outside of the country, and, those that had had done so in Canada, Australia, and Western Europe. The majority of the students were also restricted to taking engineering classes, meaning that they did not get the academic experience of learning to evaluate different cultural practices. As a result of this gap in their training, there is a tendency to either pity or romanticize the differences in culture between the U.S. and Cameroon without fully understanding the reasons for which they occur. The faculty advisor, however, discourages this type of thinking by promoting discussion across academic backgrounds, and ensuring that students in EWB enroll in a class regarding sustainability in engineering projects. This class includes discussions about different cultural protocols, cultural practices, and issues of cross-cultural engineering projects that have little to do with the engineering design of the project. Furthermore, the advisor encourages and ensures that students on the trip have the opportunity to interact with the community in non-engineering ways. This includes going to market day, playing soccer with the villagers, sitting in on water committee meetings (they are spoken entirely in French or Patois), and teaching students French phrases and words to communicate with villagers. Ultimately, the students that maintain a long-term relationship with EWB tend to be fairly open-minded and believe that there is a reciprocal relationship to be gained with the community. These students tend to approach the cultural activities with great enthusiasm, and agree that they learn a great deal from the community while on their trip.

While the reaction to the community is overtly positive, the perceptions of community processes tend to be somewhat basic in their development. Within the student group itself, there are varying opinions about the aspects that make a project successful, which have the potential to greatly affect that outcome and approach to project management and development. Interestingly enough, most students who had not visited Cameroon tended to think that they knew how to best fix the problem within the community better than the villagers themselves, while the opposite was generally found for students who had actually participated in implementation trips. Within the group itself, members tend to be split on whether the village should accept EWB solutions regardless of success or need, while others (mainly on the executive board) spent a great deal of time trying to understand the cultural factors that do determine the want and need of a project. The latter students also tended to believe that the community need not be grateful for a project if it did not fit their definitions of want and need.

These varying perspectives made for some colorful discussion about problem solving in-country, specifically, about topics stemming from problems with the technology the team had brought over. The first filter had to be broken out of the mold after a couple days of trying to find another solution. Team members were reluctant at first to go to the mason for help, but after breaking it they saw no other legitimate solution. Upon seeing the mason, they were encouraged to change the type of concrete used and to use palm oil to grease the sides of the mold. Doing this resulted in a

much easier task of removing the mold, and ultimately made the construction of multiple filters in-country possible. There was a certain hesitance about asking for help, however, because of the fear of looking inadequate in front of the local people.

It is possible that the problems that EWB faced in country were influenced by their desire to create sustainable solutions to problems. The definition of sustainability was debated many times while in-country, and there was a strong desire to find solutions that were affordable *and* desirable among community members. This included using materials for the filters that were relatively cheap (e.g. raffia for the diffuser plate, palm oil to grease the mold), and including community input on what they wanted. Because the filters were facing a great deal of difficulty gaining popularity, it appeared initially as a waste of time to continue to make them. The team, however, expressed the idea that the filters were short term solutions to a problem where the long term solution would take several years. Continuing to build them showed a commitment to the community, and a desire to increase the overall wellbeing of a community of which they were not technically members. Community members have responded well to the continued efforts of the EWB team, and as of this present time have collected over 30,000 CFA (\$60) to continue building new filters.

Conclusions on Primary Case Material

Most relevant in the case material is the long-term nature of the project. Because EWB has been involved in working on this project for close to two and a half

years now, program design has changed immensely from the initial response to the problem. This is due to the interactions with the local water committee and its individual members, help from Nura and Peter, and a general openness to changing project design when the community has expressed a lack of enthusiasm to the ideas of EWB. While information gathering has been slow, it has allowed the organization to preemptively approach issues that were not even apparent to the group at the outset of the project. When solutions are proposed by the community that are not in any way sustainable by the funds or work of EWB, the group has the ability to discuss alternative solutions to create something similar to what the community ultimately desires, which creates adaptive strategies with the new technologies to fit local concepts of need, benefit, and success. Furthermore, while there are issues within the group itself involving different viewpoints of success, the overall differences in perspectives have resulted in innovative techniques for problem solving that would not be feasible with an entirely similar group of people. The leadership, in this case, prides frameworks for receiving and acting on local perceptions. EWB-UD's overall response to the problems of water access and potable water is to continue working towards an end of a program defined as "successful" by the local community and the UDEWB.

Conclusions

There are several main aspects of NGO and development work that are immediately relevant to the success of programs in a cross cultural context as demonstrated by the cases presented above. Primarily is the importance of using community perceptions of before defining and implementing solutions to them. This is a priority because, as seen in the cases in Thailand and Papua New Guinea, problems that were initially perceived by outside groups as development issues turned out not to be appropriate adaptive strategies for local needs. The need for communication and feedback loops between the NGOs and groups within the community proved telling in the success of the India and Indonesian cases, as they encouraged the NGOs to respond appropriately to create new adaptive strategies that fit local perceptions of need, success and benefits. These cases also share another characteristic: constant adaptation to local perceptions as they become apparent. This adaptation helped them to respond to problems as they arose within the community and with the project itself. By contrast, in the Thai case, response mechanisms were not built in, and consequently the community had to react to the program-created problems without help, despite the fact they could have been addressed early on in the program.

Perhaps most importantly, however, is the long-term nature of programs related to successful adaptations of technologies, as all of the aforementioned factors rely on the acquisition of knowledge of the local populations, a process that takes both time

and understanding of social processes that dictate discussions. This can be seen in the India and Indonesian cases.

The data presented above aim to explore the relationship between community action and the development of NGO programs in terms of creating sustainable solutions to locally-defined problems and needs. Projects that did not include communities in the initial design process ultimately resulted in the creation of technologies that were maladaptive to the local societal and environmental constraints. Specifically, organizations that not only ignored these processes but attempted to override them resulted in gross wastes of time, money, and resources. Conversely, programs that included communities in the definition of the problem resulted in long-term, problem solving relationships between the NGO and the local community. This is not to say that this ensured success for all locally-based programs, but merely to explain that the solutions presented were much more likely to be adapted to fit the local constructions of need, want, success, and benefits. The continuation of the long-term relationship allowed communities flexibility and the ability for exploration of different systems in order to make sure the technologies they received would act as a solution to a problem for significant amount of time. The next chapter aims to explore the relationships between the theoretical factors in the success and failure of NGO programs and these data.

Chapter 5

ANALYSIS

Introduction

In both the theoretical and case materials discussed in the previous two chapters, strategies for NGO approaches to development issues were discussed in the context of ecological anthropology. The concept, under this framework, is that groups of people adapt specifically to local constraints on their access to resources they identify as needed for maintenance of their culturally constructed standard of living (see theory: introduction). Ultimately, these adaptive strategies involve individualized and small group manipulations of technologies, through the management and organization of production, in an attempt to maintain this access. It is important to note that the use of these cases was illustrative of NGO dynamics, as only a limited number were used and thus the conclusions from the results are limited. But they are seen as strongly suggestive concerning both anthropological theory and related development policy. In spite of the limitations of using only five cases, the information presented indicates some meaningful implications for theory about how NGO's work, how and why they succeed and fail on the ground.

Understanding this approach to adaptive strategies has serious implications for the analysis and evaluation of NGO activities working to alleviate problems related to poverty. In programmatic working to increase general economic development, health resources, and access to food and potable water, the local conceptions of poverty ultimately influence the ways in which people will interact with technologies and the agents offering them across cultures. These technologies (in their forms, functioning, and uses) will come with prescriptions that fit or ignore existing local adaptive strategies or are adapted or replaced with solutions viewed as more beneficial. The theory argues that when local strategies, including their non-technological components, are incorporated into project design, programs tend to have a higher rate of sustainability as they are a closer fit to local standards of need, benefits, and success (Cochrane 2009, Fernando and Heston 1997, Markowitz 2001).

An analysis of the case materials in conjunction with the theory results in the identification of four important systemically related variables that create solutions for these exchanges of technologies and ideas in NGO activities that, in turn, are more likely to be regarded by all participants as “successful.” The four, in order of importance, are 1) the inclusions of local populations’ definition of project purpose and design, 2) regular and actively initiated communication feedback relationships between the NGO and local community, 3) the use of ethnographic research methods in program design, and 4) the development of trust between the agency and the community. The most important of these factors is the external agent’s use of local

population's definition of project purpose and design. This means that communities are engaged in marking the aspects of their own adaptive strategies in their communities with which they are unsatisfied. Based on concepts discussed by Pelto 2001, Pisani 2008, and Cochrane 2009, the importance of developing a basis for understanding the local perceptions of need and poverty are immediately relevant to the success of programs.

This variable is closely followed by the need for regular and actively initiated communication feedback relationships between the NGO and local community. It is unlikely that NGOs will be able to predict from their own observations the characteristics of current adaptive strategies and the interplay of the new proposed strategies with old processes. Opening communication between the two agents encourages local groups to express their perceptions of need and benefits of accepting new technologies. In doing so, project design can incorporate immediate feedback from communities to promote local innovations and adaptations to the newly introduced technologies.

Ethnographic research offers the opportunity for NGOs to not only include the local community in this process, but can help them to know the most appropriate ways in which ongoing communication can take place to include the local perceptions of needs and success. These types of systems that include extensive and locally based research on local populations tend to have a strong focus on bottom-up approach to

NGO activities, as it creates opportunities for mutual long-term evaluation and embedded mechanisms that respond to the feedback loops previously mentioned.

The final variable of trust is relevant to local communities' acceptance of development gifts and projects. Projects given without any support or responsive mechanisms on the part of the NGO often create relationships between the beneficiary and donor that feel unequal or coerced. Instances where communities feel that they are partnered with the NGO and engaged in local processes that build trust, such as systems of reciprocity or discussions on highly personal subjects, can allow community members to feel that they are on equal footing with the NGO. This in turn will encourage more actively involved feedback, and facilitate the exchange of technologies across cultures so they can offer sustainable and legitimate solutions to local problems (see table 5.1)

Local Perceptions of Problems and Poverty

In instances where communities are included in defining the problem or focus of the NGO, a higher level of local investment is seen in maintaining solutions. (see India, Indonesia, and Engineers Without Borders Cameroon in Ch. 3). This relates to the need for adaptive strategies to respond to local perceptions of poverty and need. While there are elements related to ideas of poverty that could be perceived as problematic by outside groups, most communities will identify these traits simply as necessary adaptations to ecological constraints (Kottak 2004). It is important,

therefore, that local groups have active roles as agents for labeling strategies as being relevant or not relevant, and adaptive or maladaptive in the sense of the degree to which a certain individual need is met by the strategy. Even when the NGO's perceptions of a problem are accurate, instances where the community does not play a significant role in the definition of a problem can lead to a lack of maintenance of implemented solutions. The cases in Cameroon related to EWB-UD, EWB-UPENN and Scanwater are prime examples of this occurring as they each sought to solve similar problems of potable water and water access through solutions that received different receptions from the community. Because both chapters of Engineers Without Borders included the community as in active agents in defining the *problem* and developing of *solutions*, projects received higher levels of maintenance as they were seen as meeting the daily need of individuals and communities. The opposite was true in the instance of Scanwater, where the community acted as a passive agent and receiver of development gifts, and where the project was abandoned fairly quickly after its implementation. The implications of the community responses to these projects directly involve local perceptions of technology as an adaptive or maladaptive technology as related to daily and individual needs, encouraged by pre-existing restrictions of water access and central resource management.

The importance of defining this local need comes from the significance of local innovations that occur with new technologies and adaptive strategies. In the case of the EWB-UD in Cameroon, the community is able to manipulate the technologies to

fulfill their local prescriptions and ideologies as greatly as possible, meaning that solar panels can be placed and wells can be dug in the areas that will not come into conflict with local rules of water access. EWB-UD does not presume to dictate these rules, but attempts to inform the community of areas where problems might occur in the implementation of new strategies, and works to create discussions that address solutions for these problems with the water committee and other members of the community. Local stories and metaphors about how to care for and maintain the system have come about over the past year, and while they are not entirely tailored to maintain the system to its full capacity, they still serve to help the community to continue to make the important local innovations that ultimately make the project their own. The value of technological solutions comes about as a result of this innovation, and in cases where this does not or cannot occur, communities are generally unable to view the exchange of technology and ideas as valuable and real solutions that address local need.

In cases where these local perceptions of value are not fully explored or ignored altogether, communities can suffer as a result of the attempt at development. In Papua New Guinea, local adaptive strategies experienced huge problems as a result of development programs not taking into account local need. The program itself acted as a maladaptive and destructive force, as it decreased access to money and resources for the local people and placed them into the hands of the expatriates, further increasing the gap between those with regular access to valuable resources and those

without this access. Problems primarily revolved around the lack of community input in defining the problems in that the people in PNG did not perceive their economic status in the same light of poverty that the World Bank did. This led to a misappropriation of funds to finance development activities that were both unwanted and unnecessary. Years later, when the civil society sector of PNG was overhauled, local individuals were put into positions of authority that mimicked the embedded systems within the culture. Because this new system included local people who were aware and responsive to the needs and cultural processes of the area, development programs were able to take a more successful role in solving problems of adaptive strategy amongst the people. Local concepts of need and benefits therefore are an essential aspect to developing long-term and sustainable solutions to NGO projects and the instances where new adaptive strategies are seen fixing real problems in communities have shown responses that encourages both maintenance and ownership of projects.

Communication and Feedback Loops

In order to understand the local perceptions of need and to encourage the use of new adaptive strategies, the research results can be used to support the conclusion that an understanding of older and embedded cultural strategies is needed to develop new adaptations that relate to cultural and ecological constraints. In instances where ethnographic research is not pursued in depth, encouraging feedback can reveal these

processes and explore systems of adaptation that were not apparent at the initial outset of the project. The local perceptions of poverty and need can often evade NGOs in initial surveys, however, and so there is a need for constant feedback and communication between the local population and the organization to discover the extent to which the most immediate problems in the community have been identified and are being addressed. As previously mentioned, NGOs that are not locally based can view certain processes in communities as being directly related to issues of poverty when the community themselves does not view these same processes as problematic (see *How the West Defined the World's Problems*: chapter 3). Utilizing existing public forums and mutually developing new ones to use for constant communication between the two groups then has significant implications in solving problems where the local community is included as an active agent.

Problems exist with programs, however, when they respond to an initial local need, but do not include mechanisms for responding to problems that might occur in the change of strategy. While the Thailand project offered some immediate benefits to fit local adaptive need, the long-term effects of these projects were ultimately negative. The evidence for the broad acceptance of hard corn as a replacement crop is the basis for concluding that the change to cash cropping must have offered some adaptive strategy as the entire village changed over to growing corn and litchi. While this acceptance offered some short-term beneficial payoffs, however, the long term results of this project have already created problems perceived by local people in nutrition and

are likely to create them in health and economic security due to the common problems associated with mono-cropping (Jian 2001). The characteristics of these problems are such that they potentially could have been addressed productively for all involved. Consequently, short-term adaptive strategies supported by the USDA encouraged the trade-off of subsistence farming for cash cropping, but did not include ways in which the program could effectively respond to problems that the community is already facing and will likely face in the future. Because the case primarily revolved around implementation and therefore did not include feedback loops or evaluation of program results, the community is bound to face new problems of adaptive strategy that offer no easy solution as a result of the poor planning on the part of the NGO. Scanwater faced similar issues when they implemented a system that initially fit concepts of local need, but included no feedback or support to communities after implementation to help respond to the new issues proposed by the new technology. The implications based on the theory and the case material is that the characterizations of evaluation of cultural and technical responses to programs need to involve communication and feedback between the project and the NGO in order to encourage the idea that local innovations occur to make the project act as a long-term and technically and culturally sustainable solution for the communities' needs.

Engineers Without Borders has been relatively successful at encouraging feedback loops prior to and after implementation of projects. Both the solar component and slow-sand have received mixed responses, which are evident based on

the common use of such projects. Water committee meetings allow for discussion of community need and strategy for gathering water, and thus the program is able to be designed to fit this primary need. Furthermore, as problems arise with either component, whether technically or culturally, the long-term commitment (minimum of five years) of the group encourages the community to approach them with solutions so that discussion can occur about which changes could make the project better fit the local needs. The success of these feedback systems does not meet the needs, however, for including the view points of women and other marginalized groups of people in the community. At this point, there are few effective feedback mechanisms that primarily include women. The water committee, which acts as the organization's main feedback loop, is made up primarily of men, who make it clear they are uninterested in sharing the public arena with women. The issue here is not that women should have complete say in the outcomes of the projects, but that the implications for including them in program design and evaluation are huge considering their relationship to the task of gathering water. The project is most likely to be sustained if the women see it as a valid solution to aiding in their daily tasks, and therefore it would be useful to include mechanisms that encourage their feedback so the project can be adapted to best fit their needs. Communication and feedback mechanisms thus become essential in both establishing need of local communities and responding to long-term consequences presented by these exchanges in technology and strategy.

Ethnographic Research

The use of ethnographic research can be used in conjunction with feedback regarding the project to supplement knowledge of local processes, ultimately aiding in developing projects that fit local perceptions of need and want. Organizations that have better understanding of the people and local processes with which they work tend to have higher capacities for developing programs that are seen as legitimate changes in adaptive strategy by local standards. This understanding can come from extensive ethnographic research, in which organizations spend time personally doing research with populations investigating economic, political, and social systems that ultimately act as reactions to ecological constraints. In developing a comprehension of such strategies and systems, organizations can develop programs that incorporate existing adaptive strategy to make projects appear more valuable as a legitimate change. Further perceptions of need and want may become apparent in this process that were not initially communicated in the feedback that occurred between the agency and population.

In the case in India, the organization spent several years gathering data alone to determine what the primary issues in reproductive health were before proposing a solution to the problem. The organization used structured and unstructured interviews to gain information regarding a fairly private issue. As their work continued, they spread their interviewing and discussions to as many as could be reached that were engaged in sexual behavior, as this related directly to health concerns of reproduction.

The case in Indonesia followed a similar format to the case in India in terms of developing an understanding of the culture with which the organization works. The complex issues surrounding gender of men, women, *waria*, and other gendered and ambiguous groups of people were those that were often ignored by the government, a problem which ultimately contributed to the spread of HIV/AIDS as it ignored real local need. The key to achieving the information they needed to develop and run productive programming was in the organization's adaptation to this fluidity of gender. The use of long-term ethnographic research, in conjunction with strong investment in communication between the local community and NGO, created conditions under which programs could be designed as strategically useful as determined by the local people.

The issue of ethnographic research by Engineers Without Borders in Cameroon is complicated because students are only available to be in-country for three weeks every six months. This means that a great deal of the project is designed outside the country, where two-way communication is difficult and ground-level ethnographic research is nearly impossible. While Nura and the Mayor offer some important insight into the cultural processes of the community, each can only offer a limited view of the social processes that occur, and consequently it is likely that marginalized groups are unable to fully express their opinions about the project in the design stages. Furthermore, additional research investigating anthropological, sociological, or political readings on Cameroon or the Bamileke is not often pursued by members of

the organization, which could contribute greatly to fill the gaps in knowledge of marginalized groups and to better understanding local processes.

Ethnographic research can also contribute to understanding the complex nature of marginalized groups under specific political and ethnic conditions, and can have substantial implications for NGOs creating appropriate mechanisms to include these groups, some of whom the project may have the greatest impact, in design and implementation. The issue of including marginalized groups in both ethnographic research and activities for communication between the community and the NGO is not one with an easy solution, as it runs the risk of upsetting those with power or authority in the village. The inclusion of women in the process of decision making is something with which EWB-UD struggled because of the difficulty they faced with the men on the water committee, who made it very clear they had no interest in including women in the decision making process. Without knowledge of the local gender roles and scripts within the public arena, there is a difficulty associated with including the people on whom this project has the greatest effect. At this point, the significant roles of women in the village are still unknown, and thus adaptive strategies that incorporate these local roles are not being utilized in project design to full capacity. This, however, is a concern of which EWB-UD is well aware, and in the next stage of their program they are looking to implement new measures to ensure that they can be included in greater authority without upsetting the local perceptions of what an appropriate inclusion of women would entail.

Despite the lack of knowledge in specific cultured processes, EWB-UD is well aware that the social systems are complex and thus to be respected in the sense of project design and development in order for communities to view the proposed solutions as valid and sustainable. This approach differs greatly from programs that are design entirely on ethnocentric views, in which the community processes are not taken into account in any sense. Projects such as the Papua New Guinea initiative (discussed above) offer clear indicators of ethnocentric methods that none of the other, more adaptive and effective cases include. The character of the project ignored or was unaware of the real local processes taking place, and consequently designed a system that was perceived as neither useful nor valuable to the community. The implication then is that long term research can help aid in supplementing knowledge that feedback loops do not necessarily explore to the fullest extent. Ethnographic research used in program design, therefore, can help organizations working on development issues to include local processes that can facilitate the exchange of ideas and technologies across cultures.

Developing Trust and Partnerships with Local Communities

The importance of developing a relationship between the NGO and local population based on equal footing was discussed in the section on reciprocity and gift giving (chapter 4). While this variable is mentioned last in the analysis, it includes serious implications for the local perceptions of NGO incentives and ultimately,

acceptance of programmatic solutions offered by these agents. In instances where this trust is not established (Papua New Guinea, Scanwater, Thailand), programs have a tendency to be perceived as coming with certain western stipulations for accepting the new technologies. Under these circumstances, communities are less likely to make the local innovations needed to fit the new technology into already existing adaptive strategies, as they will be seen either as imperialistic (aggressive giving) or meaningless (negative reciprocity).

It is important than, that organizations work to create partnerships with local people so that the exchange is seen as one between two partners with equal investment instead of one between a donor and beneficiary. The cases in India and Indonesia perhaps best fit this need. In addition to long term ethnographic research, researchers spent hours of time discussing their own personal lives with the people with whom they were working. This worked to create a bond between members, and helped build an understanding of the incentives of the NGO. Furthermore, value and judgment statements were not offered on the part of the NGO regarding the risky behavior of the populations with whom they worked. In seeking to develop strategies for dealing with the problems of HIV/AIDS, the NGOs recognized the importance of gaining support from local community members so that the projects goals could be explained in relevant and real terms to target populations. Furthermore, the NGO organized their schedules to fit the odd hours that people worked, further increasing the probability that they could gather legitimate and realistic data. In meeting with people at hours

that were convenient for them, and in creating levels of trust and equality between the NGO and informants, the organization was able to develop strategies that fit real local need, as opposed to fulfilling problems that they thought were issues.

EWB-UD and EWB-UPENN face a greater difficulty in this aspect of their work. The limited time spend in country increased the amount of time it took for the community to begin to see the organization as trustworthy, and even on the last trip the UD chapter took, the villagers were still surprised to see the group return. It was only then that they wanted to create a sister community relationship between Newark and Bakang, which ultimately acted in hopes to ensure a long-term commitment of EWB-UD to the village. Furthermore, within each chapter, there is a high-turnover of students for each trip, as some graduate each year, meaning that the only continuous member the group has contact with is the faculty advisor. This can create boundaries in developing levels in trust between the new students and communities, specifically for the UD chapter when most speak very little French, the national language of Cameroon. This made it difficult for the group as a whole to gain both a rapport and trust with the community that would open communication between various groups for discussing local issues in local terms. Within the last trip, however, there has been a growing view that the EWB group is committed to the long term nature of the project, the result of which is causing more discussion in the available feedback loops. This increase in communication, while sometimes strained for differences of opinion, will

ultimately contribute to the equal commitment of EWB-UD and community in creating real and legitimate solutions to the problems of water access.

The issues that EWB-UD and EWB-UPENN face as a result of being out of country for such a great amount of time are insignificant in the face of other, less culturally aware projects. Their increasingly productive relationship with the water committee and their deference to local culture and processes has demonstrated a commitment to achieving a legitimate and sustainable solution to the problem of water access as defined by local people. While problems sometimes occur, the long-term nature of the project and the EWB-UD and EWB-UPENN's interactions with the water committee allow for feedback and a trust to grow amongst the higher level members of the village. As this trust grows, it becomes easier to reach the lower and more marginalized populations, a process which would be facilitated with better knowledge of the local population as a whole. For the situation as it exists, however, it appears that the long-term nature will encourage better feedback as the group continues to work with the community. Furthermore, as the group continues to return, problems that arose with projects since the group has left are able to be addressed, and local solutions that have taken place are discussed with the groups. Through this process, EWB-UD and EWB-UPENN gain knowledge of the local processes of conflict management and decision making, which they only include themselves in when the community invites them. While some problems exist in the execution of ethnographic research, the group does a good job of facilitating the exchange of

technologies across cultures and encouraging local innovations of projects to fit village concepts of need, benefits, and success.

Bottom-Up Programming

In the previous paragraphs, issues of developing an understanding of local perceptions of want, need, and success were discussed as being essential to facilitating the transfer of technologies intended to change adaptive strategies in development projects. In order for projects to achieve these goals, program approaches (top-down vs. bottom up) for NGO design need to be incorporated to encourage the innovations of technologies to fit local needs, benefits, and wants. In the instances where bottom-up programming was pursued (India, Indonesia, Honduras, and EWB-UD Cameroon), programs were able to fit concepts of local need and adapt technologies to fit each of the individual needs. These programs were largely designed either out of country, but only after significant discussion with local populations occurred. Furthermore, the nature of these bottom-up programs designs in the flexibility for continuous changes to program design based on the active and intentional two-way communication built into program design. These changes work to encourage the exploration of new adaptive measures that fit local needs through local innovations. The greatest difficulty these bottom-up programs face, however, is access to resources and funds to encourage these new innovations, and so they are consequently always under pressure to obtain

these, which can hamper the time groups have for ethnographic and long term work that encourages these feedback loops.

Top-down programs, such as the ones in Thailand and in Papua New Guinea, only focus on development in gross economic terms, and a focus that does not include mechanisms that encourage local innovations or even fit local concepts of need, benefits and success. While the Thailand project did result in creating a strategy that was viewed locally as adaptively useful, the long term results appear to have created serious consequences for which the development program offered no solutions. The large nature of the programs themselves creates a vacuum in which local concepts of want or need become overshadowed by grand generalizations of what determines wealth or poverty. This is often due to the sheer size of these types of programs that work to alleviate poverty for hundreds or thousands of people at a single time. The difficulty of this system is that concepts of poverty and change are based on culture and individual experience. Thus, programs that seek to eliminate poverty through one large adaptation often ignore those for whom poverty is the greatest threat. The advantage that top-down programs have over bottom-up is that their very nature requires them to have huge amounts of money in order to implement their solutions. This means that programs such as the ones in the Papua New Guinea and Thailand cases do have the resources to involve the long-term commitment to and research on communities before implementing solutions to issues of poverty, but they rarely do so.

The reason is that they generally do not find such information relevant for the definition of problems and program design.

Engineers Without Borders UPENN and UD chapters, under these conditions, act as a creative solution to these issues, with benefits from both top-down and bottom-up programs. As a large scale institution, the organization includes a central agency that is responsible for bureaucratic problems and gross fundraising. This means that individual chapters, while still holding great amounts of responsibility for seeing through their projects, have the support of a greater institution for both funding and advice in terms of what technologically is sustainable. Furthermore, because the student organization resides in a University, it has access to further funds and technical support that bottom-up programs typically lack. Because there are local chapters with local communities as the sole focus, however, the organization can include research before designing programs that includes local perceptions of need and want, as well long-term feedback mechanisms for groups to explain whether they view the adaptive strategy as valuable under local terms.

Conclusion

Given the long-term consequences of development programs for the lives of local populations, programs to be judged as both effective and responsible require mechanisms that integrate local perceptions of want, need, benefits and success. Ensuring local perceptions are built into program design includes utilizing

ethnographic research and feedback loops so that the community and NGO can constantly adapt to the new perceptions of the technologies being exchanged. Furthermore, there is a need for communities to develop partnerships and levels of trust with the NGO in order to create new adaptive strategies, something that is facilitated by the long-term nature of programs. Based on the evidence from a very limited number of primary and secondary cases, it is suggested that using a bottom-up approach is most beneficial for including these mechanisms and for creating results that are seen as sustainable and seen as valuable solutions to local populations. Within the exploration of these factors, however, are serious implications for program design and policy for general NGOs and Engineers Without Borders that will be discussed in the next chapter.

Chapter 6

CONCLUSIONS

The themes relating to the exchanges of technologies between local communities and non-governmental organizations involve significant investment in understanding the ways in which local adaptive strategies are formed and enacted. The interplay of strategies involves complex processes deeply embedded in culture. These include local adaptations striving to gain access to essential resources, and include related systems of reciprocity, gender roles, and technologies. Most important out of the theoretical research is the significance of understanding the nature of local innovations in adaptive strategies. These creative acts by individuals and the community as a whole create a way in which resource management becomes locally significant and valued. All of these are directly related to creating local constructions of poverty and well being that determine the ways in which people interact with solutions to adaptive problems that are offered by external, non-local structures.

The implications for the success and failure of development initiatives undertaken by NGOs include an essential injunction to incorporate these local concepts of poverty and need into their project design, implementation, and evaluation. The cases discussed in which this injunction essentially was followed (India,

Indonesia, Honduras, and Cameroon) received a more involved, more adaptive response from community members. As a result, each project was seen by community members as a more or less legitimate response to their own local needs. It is important to note that the use of these cases was illustrative of NGO dynamics, as only a limited number were used and thus the conclusions from the results are limited. But they are seen as strongly suggestive concerning both anthropological theory and related development policy. In spite of the limitations of using only five cases, the information presented indicates some meaningful implications for theory about how NGOs work, and why they succeed and fail on the ground. The theories encompass inclusion of local perceptions of need and appropriate solutions in program design, the use of ethnographic research, the use of feedback mechanisms, and development of partnered relationships between agents. In instances where local strategies and perceptions were not included in development programs, such as in the cases of Papua New Guinea and Thailand, communities were less likely to include mechanisms for engagement in essential local innovations, these were more likely to have results that at least were problematic for the medium term for the local people (i.e., Thailand) and, worse, even counterproductive for local communities (i.e., PNG). NGO structure, therefore, needs to act in such a way that can include these programmatic issues in their design and implementation. Under these circumstances, bottom-up programs served as better structures for including community perceptions, as they tend to be designed locally as opposed to out of country.

Working to design programs in country enables organizations, therefore, to include levels of community feedback that best express the ways in which adaptive strategy works. Constant communication between the local groups and the NGO's opens up channels for external agents to adapt programs to fit the changing needs of the community as the agents learn more about them. In achieving this constant feedback, NGOs need to include information from marginalized populations, typically women or ethnic minorities, who often perform major tasks within the activities on which the development initiatives are focused. This challenge must be addressed if the NGO is to act effectively to include their perspectives in their planning stages. This, in turn, is critical if benefits for those on whom the project has the greatest or important effects will fit local perceptions of need. Further responses involved during implementation on the part of the NGO should revolve around predictive measures designed to deal with long-term issues that might accompany the new adaptive strategy. The case in Thailand included a culturally valid adaptive strategy, but did not include long-term planning of agricultural development into program design. Communities, if left to deal with these circumstances on their own, may determine the new technology to no longer fit their concepts of success, and therefore may be abandoned, even though the project may have had potential to offer significant long term benefits for the village. The long-term nature of projects can aid in this process, and in encouraging communications that can promote local innovations of non-local technologies.

While there is a substantial amount of work published on the nature of NGOs and concepts of success revolving around local need, there are gaps between the theoretical and case material about how to best include community input. The limited case studies included above that were justified as being most successful in promoting exchanges of technology included long term ethnographic research and community definition of problem for programmatic design. Within this research, however, is a need for more case studies, specifically concerning potable water issues that may be indications of problems not evident in the current research having to do with cultural restrictions on water access and community perceptions of water projects. This calls for a greater investigation into cases from both large and small organizations that could strengthen the arguments made about the variables presented in the analysis chapter.

Further general research needed involves work investigating appropriate feedback mechanisms for marginalized groups in society in a way that does not upset the political powers but still manages to include groups that could prove essential to local innovations and maintenance of projects. Within the current literature and even with the cases presented, there are no clear structured mechanisms presented that legitimately involve these populations, a problem that has serious implications for the overall success of projects. Other central issues revolve around the need to investigate the problems NGOs face about the way they represent themselves to donors and how that is in conflict with being fluid about even the purpose of being on the ground. The

large gaps between donor and local perception of want can create problems for NGOs by putting them in a mediating position between these two groups, in instances where one group is trying to convince the other of their perceptions of need. The ultimate outcomes of these pushes have significant implications for NGOs including the previously mentioned variables related to success, and greater research about the characteristics of these relationships could have huge impacts on changes in project design and implementation.

Implications for Engineers Without Borders based on this research include several recommendations for future programmatic activities. While the local focus is evident in their work, efforts in country could be enhanced by a greater amount of time spent on preparation through a review of relevant ethnographic literature on communities of the intended area, and on design and implementation trips. Programs of this nature should require a minimum of a month in country, so that necessary communication and the social relationships that create its foundation are nurtured and changes to program design and implementation can be made while the organization is still in the country. Further recommendations revolve around encouraging EWB to continue a multi-academic approach on projects, and to involve themselves in higher collaborations with those in the non-engineering discipline. Included in this would be the addition of cultural consultants to each region of the national organization, much like the technical advisory board. Individuals contributing to this could have long-term experience working with populations in the specific region to which chapters

were going, and could potentially offer valuable solutions to cultural issues not initially explored by the engineers.

Other significant issues presented within EWB activities, primarily with the UD chapter, involve the lack of local language abilities on the part of the students. Neither French nor the local language is spoken with any proficiency by the students, which ultimately inhibits understanding the local processes and even local perceptions of want or need. It would be beneficial for students, therefore, to go through either an intensive language course to be completed before the trip or to be required to have a background in the national language of the country. In some instances, it might be beneficial to hire a translator, but in doing so, individuals would still miss out on the direct manipulations of language taking place that could be useful in incorporating local perceptions and ideas.

One final recommendation revolves around the issue of ethnographic research. Because the bulk of project design and development occurs outside of the village, it is important that the group has a good understanding of the local processes dictating water needs and cultural restrictions to access of water as this can be a determining factor in the local acceptance of the project. Because real ethnographic research is difficult to achieve in the short time that the organization is in-country, a thorough literature review conducted by the members or the organization regarding ethnic groups and regional processes could supplement this need. Collaboration with a leading professional on similar topics could also be useful in this area, as they would

be able to point out important sources to guide and encourage further research in relevant topics to help develop truly sustainable solutions to locally defined problems.

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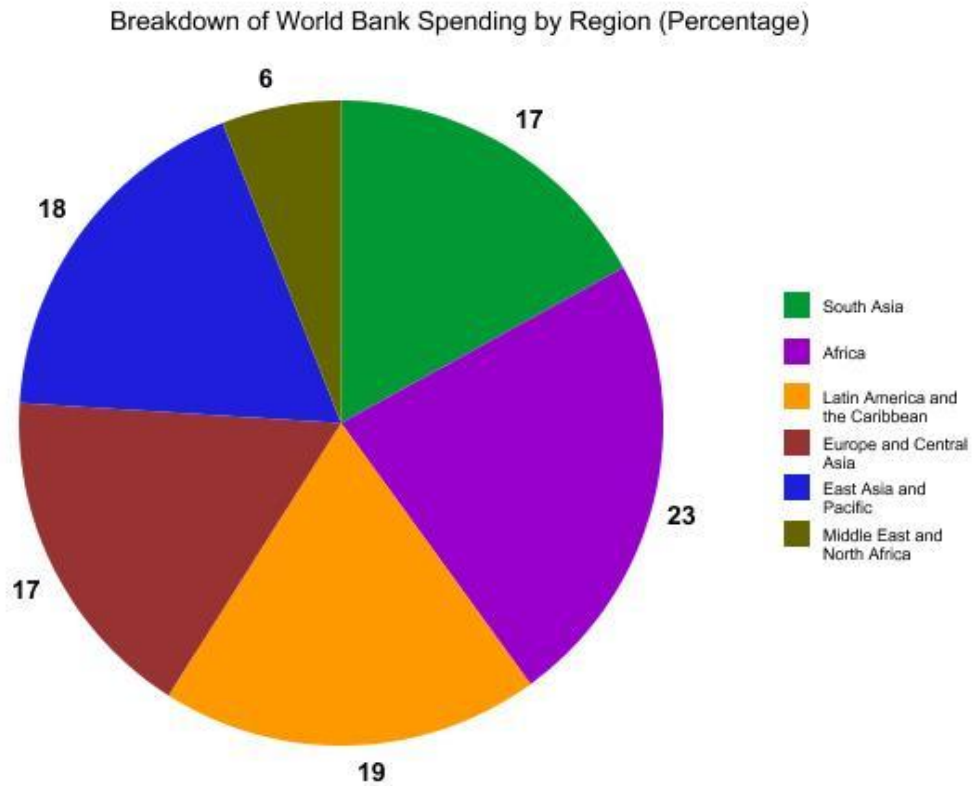
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APPENDIX 1 : FIGURES, TABLES, AND IMAGES

Table 3:1 Breakdown of World Bank Spending by Region



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Table 4:1 EWB Decision Matrix

| Solution Criteria | Solution | | | | | | Criterion Importance (0 to 10) | Criterion Nature (+=good -1=bad) |
|--|---------------|-----------------------------------|------------------------|---------------------------------------|---|--|--------------------------------------|---|
| | UV Filtration | Retrofitting Hand Dug Wells | Rainwater Catchment | 3 Drilled Wells with Hand Pumps | 3 Drilled Wells with Submersible Pumps | | | |
| Water Quality | 10 | 8 | 6 | 9 | 9 | | 10 | 1 |
| Scope of Impact | 7 | 9 | 8 | 7 | 9 | | 4 | 1 |
| Ease of Use | 9 | 10 | 9 | 10 | 10 | | 8 | 1 |
| Ease of Maintenance/Repair | 6 | 6 | 5 | 6 | 3 | | 8 | 1 |
| Cost to Implement System | 2 | 2 | 6 | 7 | 9 | | 6 | -1 |
| Cost to Maintain System | 3 | 1 | 4 | 1 | 2 | | 7 | -1 |
| Lifespan of System | 8 | 8 | 6 | 8 | 8 | | 10 | 1 |
| Availability of Parts In-country | 8 | 9 | 7 | 9 | 1 | | 7 | 1 |
| Travel costs of Implementation Team | 3 | 8 | 5 | 7 | 10 | | 2 | -1 |
| Time to Design System | 2 | 5 | 3 | 3 | 6 | | 10 | -1 |
| Time to Implement System | 4 | 6 | 4 | 4 | 7 | | 5 | -1 |
| Average Walking Distance to New System | 10 | 3 | 1 | 7 | 7 | | 7 | -1 |
| Likelihood of Community Acceptance | 7 | 9 | 9 | 10 | 10 | | 9 | 1 |
| Novelty/Excitement Generated | 7 | 3 | 2 | 3 | 3 | | 10 | 4 |
| Seasonality of water source | 10 | 0 | 10 | 0 | 5 | | 8 | -1 |
| Total Score | 262 | 384 | 215 | 347 | 215 | | | |

Table 5:1 Four Variables in the Effectiveness of Development Programs at the Local Level

| Cases | India | Indonesia | Cameroon | Honduras | Thailand | PNG |
|---|-------|-----------|----------|----------|----------|-----|
| Local Definition of Project Purpose | x | X | x | x | 0 | 0 |
| Need for Community Feedback | x | X | x | x | 0 | 0 |
| Use of Ethnographic Research Results | x | X | 0 | 0 | 0 | 0 |
| Development of Trust between Agency and Communities | x | X | x | x | 0 | 0 |

Where x represents the presence of a variable and 0 represents the absence of the variable.

Image 4:1 Map of Cameroon



Image 4:2 Protective Casing of Water System



Image 4:3 Solar Panels and Fence

