ASPECTS OF SUCCESSFUL SUSTAINABLE DEVELOPMENT PROGRAMS WITH AN EMPHASIS ON LATIN AMERICA: A COMPARATIVE CASE STUDY

by

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THESIS ABSTRACT

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Public participation is assumed to benefit sustainable development. Actual effects of public participation, a requirement of some international agreements and funding programs, are not widely documented. I compare 16 local sustainable development programs, defined as those with economic, social, and/or environmental goals intended to not diminish economic, social, or environmental assets. Within participation, I distinguish between segments of the population, means, and timing. I also consider the roles of government and the number and type of goals of each program as alternative influences on sustainable development.

Successful programs commonly have more segments of the population participating in ways that are more meaningful. Programs with social goals are typically more successful than those with only economic and/or environmental goals. This information can be used for planning sustainable development programs and updating requirements in funding guidelines to reduce investment risks and more consistently realize the benefits of sustainable development programs.

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CHAPTER I

INTRODUCTION

Public participation has become a fundamental part of sustainable development programs. *Our Common Future*, or the Brundtland Report, popularized sustainable development and thrust it into the spotlight of a series of international conferences in the 1990s, including the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro (Hunter, Salzman & Zaelke, 2007, p. 181). Both the Rio Declaration and *Agenda 21* resulted from UNCED (Hunter et al., 2007, p. 187). The sustainable development discourse now crosses disciplines of environmental science, social anthropology, geography, and political science, among others. Moreover, sustainable development is the focus of several international, national, and local initiatives worldwide.

Public participation of some kind is a requirement of many international funding organizations when deciding whether to fund sustainable development projects. Local Agenda 21 strongly emphasizes public participation, and academics from sociology to environmental science agree that public participation is necessary to successful sustainable development programs (*E.g.* Fraser et al., 2006; Kates & Parris, 2003; Guha, 1989; Dernbach, 2003; Bürhs, 2009). In the United States and many other nations, public participation has been codified into the environmental assessment process for major development proposals.

There are several logical and ethical arguments for why public participation is necessary. Ethically, ideals of justice require communities affected by an action to have some say over it. This ethical claim is accepted for the purposes of this research.

Logically, the public will support programs when they have the opportunity for community 'buy-in' through participation. Further, if a program is truly sustainable, it should eventually be able to continue without outside support. In order for that to happen, those benefitting from the program must have agency in the process; they must feel the program belongs to them. At the very least, public participation should ensure services or development that will benefit those it is intended to serve. The purpose of this research is to reconsider the logic of public participation in sustainable development program design.

Sustainable Development Design Uncertainty

Despite the general acceptance of public participation, little comparative data exists to verify the usefulness of participation. It may be that public participation needlessly slows the development process. It may be that other factors, such as government funding are more indicative of success but not currently emphasized. It may be that participation is not related to outcome at all but is simply an ethical ideal.

Furthermore, there is controversy about what and whom local "participation" includes. *Agenda 21* requires local participation, supposedly because it makes programs more effective. Participation ranges from a minimum of public access to information to a maximum of local creation and control of sustainability projects. At a minimum, local government officials lead stakeholder groups consisting of local business owners. At best, local individuals head groups of citizens representing every aspect of a community, from the poor to indigenous women to trade unions. Some scholars claim that nothing less than the maximum participation is acceptable because all community members must have agency (*E.g.* Matarrita-Cascante & Luloff, 2010, p.739), while others realize this is

simply not realistic in many developing areas where power dynamics are well-established and slow to change (*E.g.* Etzioni, 2000, p.189).

Consequences of Design Uncertainty

Sustainable development can be used as a legal tool to reach ecological sustainability (Ross, 2009, p. 54). In order to make appropriate management decisions and policies, it is important to find a logical sustainable development program design. With this information, governments, nongovernmental organizations (NGOs), and other interested entities will be able to better create and support sustainable development plans.

With regard to the usefulness of public participation in sustainable development program design, there are many possibilities that make the logical claims for such requirements speculative. The costs of not knowing precisely what impact public participation has on local sustainable development plans may be great. More importantly, the benefits of knowing the components needed for successful programs are immense: funding risks would be diminished, real returns would be maximized, and actual benefits to communities could be more consistently realized.

Research Questions

Is participation indicative of success in local sustainable development programs? Does the influence of participation depend on which segments of the public participate, by what means, or at what stage in the program implementation? Are there other testable explanations for success, i.e. the government role, program content, or balance of sustainable development aspects within the goals? In order to assess the components of successful sustainable development programs, it is first necessary to ask: What is successful sustainable development and how can it be measured or judged? The answer

to this will create a dependent variable to measure against the potential factors leading to success.

Research Purpose

This project set out to identify factors that contribute to the success of sustainable development plans. Sustainable development is an attempt to balance economic, environmental, and social needs of today without compromising those of the future. This paper analyzes the best practices for sustainable development programs, looking particularly critically at participation, through a comparative case study of local sustainable development programs in developing nations. Government role and program content or goals are also considered as potential factors of influence. Participation, or aspects of it, plays an important role in the success of such programs, as does a balance of goals in each of the aspects of sustainable development.

CHAPTER II

LITERATURE REVIEW

Before analyzing which factors might further the success of sustainable development programs, "successful" sustainable development must be defined and the potential factors of influence identified. Many identified factors may contribute to the success of sustainable development programs. These factors can be grouped into three categories: (i) public participation, (ii) government role, and (iii) program content. Existing literature on these factors will be examined after that on "successful" sustainable development.

Defining "Success" in Sustainable Development

To define success in sustainable development, it is important to clarify what "sustainable development" means and how it can be measured. However, sustainable development is an evolving concept, and can adapt to different places and stay current with changes in technology, science, and other human conditions. As a general concept, it is widely supported and even the specific goals of sustainable development programs primarily vary in only their priority levels.

What Sustainable Development Means

What, precisely, sustainable development means is difficult to define (Kerkhoff & Lebel, 2006, p. 448; Parris & Kates, 2003b, p. 560; Ross, 2009, p. 34). "There are at least 10 major categories of literature that explicitly address the question of sustainability" (Pezzoli, 1997, p. 553). Certainly, by now it has grown even larger. The literature summarized here debates the meaning of sustainable development and suggests that it may mean different things depending on culture or development status.

In the 1960's, sustainability was conceived of as a primarily ecological concern, and development was viewed as negatively impacting it (Pezzoli, 1997, p. 552). Sustainable development suggested that environmental degradation could harm development as well (Pezzoli, 1997, p. 552). The standard Brundtland definition of sustainable development, published in 1987, is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED). This purportedly Western concept reflects a Kenyan proverb: "We do not inherit the Earth from our parents, we borrow it from our children" (Pezzoli, 1997, p. 549). Hopwood, et al. points out that sustainable development is useful as a framework for discussion and that it is neither intended to be, nor very useful as a singular concept or principle (Hopwood, 2005, pp. 40, 49). "Its openness to interpretation enables participants at multiple levels, from local to global, within and across activity sectors, and in institutions of governance, business, and civil society to redefine and reinterpret its meaning to fit their own situation" (Kates, Parris & Leiserowitz, 2005, p. 20).

This sentiment is implicit in the international policy on sustainable development. The Rio Declaration on the Environment and Development and the accompanying *Agenda 21* officially put sustainable development on the international agenda in 1992 though it failed to create a binding commitment (Hunter, et al., 2007, p. 187). Local governments were invited to create local *Agenda 21* ("LA21") plans to increase local participation and cooperation (Hunter, et al., 2007, pp. 195-196). No further attempt to define sustainable development was made in either document but instead details were left for local participants to determine.

Some critics of policy literature on sustainability claim there is a Western bias in the entire approach and definition of environmental problems (Pezzoli, 1997, p. 566). Such critics suggest the need to incorporate local ideas into the definition and approach of sustainable development. Literature on local sustainability design (e.g. eco-city design), meanwhile, "does not adequately take into account the relationship between production, consumption, and circulation. [It] implies that sustainability can be achieved at a local level, without reference to the increasing globalization of the economy" (Pezzoli, 1997, p. 570). Despite ambiguity and criticisms, sustainable development "has evolved a core set of guiding principles and values, based on the Brundtland Commission's standard definition" (Kates et al., 2005, p. 20). Moreover, there is "near-universal agreement that sustainability is a worthwhile value and goal" (Kates et al., 2005, p. 20).

One thing the sustainable development literature fails to discuss is that to assess local sustainable development, it might be useful to first define community development. According to one author community development is community (or solidarity) and development (or agency, capacity to order one's own world) (Bhattacharyya, 1995, p. 61). Agency includes self-help measures, acknowledgement of felt need within the limits of universal norms, and participation (engagement in the process from the beginning) (Bhattacharyya, 1995, pp. 63-64). Although, usually not defined in this manner, sustainable development typically does encourage agency and participation, and LA21 specifically calls for local stakeholder involvement, especially women, minorities, and youth.

In summary, the meaning and measure of sustainable development relies on the premise that nature, life support, and community must be sustained while people,

economies, and societies are developed (Kates et al., 2005, p. 11). The differences in meanings of sustainable development can be seen as differences in "what to sustain, what to develop, and for how long" (Parris & Kates, 2003b; Parris & Kates, 2003a, p. 8068). Differences in policies and politics generally are debates over how much weight each factor should be given or how to prioritize the issues. Ultimately sustainable development is an evolving idea, adaptable to different locations and times.

Already it has evolved from an economic development and environmental protection focus to include social development, and sometimes other considerations. If a rigid and static meaning, or measure, for sustainable development is created, the dynamic of changing technology, science, politics, and time will be lost from it and it will quickly become obsolete. As long as researchers clearly outline their definition of sustainable development and which emphasis they favor, the ambiguity of the phrase should not inhibit the sustainable development discourse. Thus, in this paper, sustainable development programs are defined as economic development, social development, and/or environmental protection that are intended to not diminish economic, social, or environmental assets.

How Sustainable Development Is Measured

Although it is apparent that measuring sustainable development success will require looking at the social, economic, and environmental effects of a program, how exactly such effects should be measured and compared is debatable. To determine how to best measure sustainable development success, it is first necessary to consider why indicators of success are important, in other words, what their purpose is. Then, the characteristics needed to accomplish that purpose, or those purposes can be identified.

Once the criterion for good indicators is established, existing indicator options can be evaluated, or new options created.

Why Indicators Are Important

Despite major growth in the use of sustainability indicators since the 1990s, actual policy change effectiveness continues to be low suggesting the need to tie indicators to policies more (Pinter, Hardi & Bartelmus, 2005, p. 3). The requirement of salience in science and policy requires that indicators provide information that can be used in daily decisions (Orians & Policansky, 2009, p. 382). A case study of three sustainability indicator initiatives in 2005 found that bottom up indicator selection by community stakeholders was generally good for community empowerment but not for policy implementation, and therefore questionable for sustainability (Fraser, Dougill, Mabee, Reed & McAlpine, 2006, p. 126). Deductive scales and indexes, like McGranahan's criteria for judging the sustainability of cities (2003), are primarily useful for comparison but not prediction, reducing their salience in policy making. Predictive scales would be useful for planners to create successful sustainable development programs.

Selections of model scale and indicator units are important because they must allow appropriate comparisons and effective changes (Parris & Kates, 2003b, p. 580). Indicators meant to track changes that transcend political boundaries must be compatible with indicators in those other political boundaries, in order to effectively respond to such changes (Orians & Policansky, 2009, p. 383). Thus, the purpose of sustainable development indicators is threefold: to track program/policy success, to compare programs/policies, and to use those comparisons to create programs and policies that are more successful in the future. The first two of these are of primary importance in the

present research. Thus, models and indicators selected must accurately display success in a way that is comparable across cases.

Evaluation of Model and Indicator Options

To describe models of sustainable development, goals, indicators, and targets should be clearly distinguished. "Goals are broad, qualitative, statements about objectives," "indicators are quantitative measures that are selected to assess progress toward or away from a goal," and "targets use indicators to make goals specific with endpoints and time tables" (Parris & Kates, 2003b, pp. 572-573; Parris & Kates, 2003a, p. 8068). Three attributes of model creation and indicator selection may determine a policy's effectiveness: credibility, salience, and legitimacy (Parris & Kates, 2003b, p. 573). Public perception of the importance of an indicator is necessary and a small number of indicators can increase the public's understanding (Orians & Policansky, 2009, p. 383). However, more varied stakeholders can mean longer lists of indicators in an effort to be inclusive (Kates et al., 2005, p. 16). When indicators are different for the same goal, it makes comparisons less viable. However, indicators can indicate progress towards or away from a goal and can help to focus development processes (Parris & Kates, 2003b, pp. 571-572).

Capital-based models use monetary values of stocks and flows for their indicators. All the other model types use various performance indicators. Performance indicators might be goal-oriented by being compared against a target. For example, one may measure the rate of extraction of a renewable against the rate of regeneration (Orians & Policansky, 2009, p. 385). Goal-oriented performance indicators may also measure the

emissions of a pollutant against a baseline target level where a sustainable target is not available.

Other performance indicators may show trends by measuring performance changes over time. Trends are directional changes in indicators over time. They are common in national and international data sets. These can provide useful information but do not actually show whether levels are sustainable or not and are not easily aggregated (Orians & Policansky, 2009, p. 392). Trends may be necessary where there is not a known sustainable level for something to create a target or when a meaningful baseline is not available. Because sustainable development takes place locally, it is necessary to identify trends relevant to local populations and their ability to effect change (Kates & Parris, 2003, p. 8066).

Finally, status indicators are based on qualitative data. They often represent negative, neutral, or positive changes towards a goal. These are used where there is not enough quantitative information for the other indicator types. Local programs rarely have long-term data for trend indicators or quantitative measures for baselines or targets so case studies here will need to be compared using status indicators quantifying the qualitative data about program results. This method also overcomes the challenges of desiring both a small number of indicators and an inclusive indicator selection process by measuring a general movement toward or away from sustainable development based on whatever indicators each case used. Thus, if one program looked at job creation as an indicator of success and another at income as an indicator, results of each could be considered indicators of success in economic development, one of the aspects of sustainable development.

Models Available to Evaluate Sustainable Development Indicators

The model, or framework, used to compile indicators can vary. All of the models of measurement must use indicators of some type but the type of model can determine the particular types of indicators used. It can also determine the best type of output, among other things. Parris reviewed existing scales and indexes of sustainability and found that most were "deductive, or top-down in nature" (2003b, p. 569). The most common frameworks used for sustainable development models are capital-based, Pressure-State-Response (PSR), Well-being, and Theme-based. The last of these is the only truly bottom-up model of the four.

Capital-based frameworks measure everything in terms of monetary value. Environmental capital-based indicators measure the "natural capital" based on actual monetary values of resource extraction and estimated monetary values of ecosystem services and other anthropocentric values (Orians & Policansky, 2009, p. 385). Capital-based models are recommended by some as a method to increase sustainability through greening of industry, consumption patterns, and resource use (*See* Lebel & Lorek, 2008).

However, as much as a capital-based model might be useful as a technique for economic restructuring and/or economic development, it is not a sustainable development program as this paper defines one. Specifically, capital-based models do not consider environmental, economic, and social issues together but focus on one in the hopes that the others will follow. They include only measures of economic factors, or economic and environmental factors, at best (Pinter et al., 2005, p. 19). Some environmental factors cannot be adequately represented in such systems (Orians & Policansky, 2009, p. 396).

Despite a recent attempt by Eurostat to suggest a 'capital-based' model of

measuring sustainable development, it is clear from their own report that such a system is not adequate for measuring sustainable development at this time for two reasons: lack of social capital measures and lack of ability to measure short-term well-being (United Nations Economic Commission for Europe & The Organization for Economic Co-Operation and Development and the Statistical Office of the European Communities (EUROSTAT), 2009, pp. 8-9, 73). Thus, no attempt was made in this analysis to sample capital-based models and discussion of them is limited.

Another common framework is the Pressure-State-Response (PSR) system, endorsed by OECD in the 1990s (Orians & Policansky, 2009, p. 385; Pinter et al., 2005, p. 5). This model uses performance indicators matched up to identified pressure and response indicators and is meant to draw attention to the relationships among pressure events, environmental problems, and policy responses (Orians & Policansky, 2009, p. 385). PSR models can be problematic in that they may oversimplify or overlook causal linkages (Pinter et al., 2005, p. 5). Additionally, tying specific policy responses to indicators risks unnecessarily delegitimizing the entire model by incorporating values some stakeholders will not share (Orians & Policansky, 2009, p. 394). Since the primary purpose here is to track and compare cases with an effort to find causal linkages, PSR is not a good fit.

Aggregate models typically either measure human well-being or ecological well-being as an aggregate. They are easily comparable but give such a simplified picture that they are not useful for showing relationships between complex indicators. The authors of one article create a model to indicate "biophysical sustainability" (Wackernagel, et al., 2002, p. 9266). It is similar in style to the footprint model but focus on six human

activities requiring biologically productive space (Wackernagel, et al., 2002, pp. 9266-67). The authors claim this model is a method of quantification that is easy to calculate with existing data, though it is not perfect (Wackernagel, et al., 2002, p. 9269). The data required for such models may be available at a national level but not a local level. Additionally, this research requires a more detailed look at the relationships than an aggregate model would allow.

Lastly, theme-based frameworks are indicator sets arranged into groupings, or themes. A typical sustainable development theme-based model would divide indicators relatively evenly into the three themes of social development, economic development, and environmental protection. Based on a survey of local sustainable development programs with reports online, theme-based sets are often displayed as 'report cards' with grades or some other shorthand of status indicators for each of the different themes. Theme-based outputs are by far the most common model chosen by these local development programs, possibly because they tie the models to identified stakeholder interests in a clear and meaningful way. This model type is the most compatible with the status indicators described above. A sustainable development success score can be derived from status indicators of social, economic, and environmental progress.

Modeling Achievement in Sustainable Development

One study found that overall goals of sustainable development were fairly consistent worldwide but that the indicators and targets varied widely (Parris & Kates, 2003a, p. 8070). Ruhl suggested, in 1999, that a multidimensional algorithm of sustainable development based on complexity theory be developed because sustainable development is and should be constantly evolving (Ruhl, 1999, p. 63). However, we are

far from such a mathematically precise model of measurement for sustainable development. Sustainable development goals and indicators differ because they are based on different theories of sustainable development emphasizing different aspects of sustainable development, because of the information available for comparison, and because of the intended uses of the information.

Some theories of sustainable development emphasize economics. Most economic theories that portray economic growth as a means to environmental protection once everyone "catches up" with industrial nations are basing their theories on the Kuznets curve which focuses on environmentally harmful activities in a nation, namely production (Rothman, 1998, pp. 177-78). Rothman argues that such a model is inaccurate because the eventual reduction in harmful activity most industrial nations have experienced is directly related to their ability to offshore harmful production processes (1998, p. 187). If all the other nations "caught up," overall pollution would increase because there would no longer be anywhere to send harmful industries (Rothman, 1998, p. 187). Thus, while economic growth may be desirable it cannot be assumed that economic growth equates to eventual environmental protection.

To create a theme-based model of performance indicators of sustainable development based on the definition used here, it is necessary to consider what indicators would display economic, social, and environmental success. For example, Bürhs claims that Environmental Space is the best method to adopt at a global level to reach resource sustainability and intergenerational equity while legitimating international governance (Bürhs, 2009, p. 112). He defines Environmental Space as the total space for use by people without diminishing future use (Bürhs, 2009, p. 112). Thus, sustainable use of

land and resources may be a useful method of assessing environmental success. Table 1 (below) lists other examples of indicators of success.

Table 1. Examples of indicators of success in each area of sustainable development

Economic Success	Social Success	Environmental Success
Job Growth Increased Income Skills Acquisition/Job Training Increased Ability to Purchase Clothes, Food, etc. Increased Financial Security	Education Cultural Preservation Increased Health or Health Care Agency/Empowerment of Individuals Increased Access to Justice for Women and Indigenous Peoples	Shift to Sustainable Resource Use Environmental Restoration of Degraded Areas Pollution Controls/Reductions Conservation Measures to Protect Natural Areas Decreased Reliance on Unsustainable Resources

Factors that May Affect the Success of Sustainable Development Programs

Public Participation, Agency, and Rights

Public participation is now a common requirement of sustainable development programs. Aside from claims that public participation is ethically necessary, some claim public participation increases the chances of program success. *Which segment(s) of the population* the "public" includes, what "participation" entails (i.e. *by what process* it occurs), and *at what point in the project* it happens, are all variables affecting the outcome of the public participation process. Varying interpretations of public participation stem from the different theories for why it is important. A summary of the current answers to the why, which segment(s) of the population, by what process, and at what point in the project follows.

Why Require Public Participation?

The main reasons for having a public participation requirement are ethical, due to the agency aspect of it. Public participation increases legitimacy of a program because people have their rights recognized and are able to influence their world (i.e. they have agency). It is not only nice to have community ownership of sustainable development plans but it is intrinsically part of the definition of sustainable development, under the aspect of social development. However, the extent to which social development is part of a sustainable development initiative may also play a role in the program's success, thus it will be necessary to consider social development as both a cause (as part of content) and effect (as part of success).

Environmental protection without local input can be inequitable and socially unsustainable (Guha, 1989, pp. 72-73). Environmentally minded tourism development can be a tool of oppression when the local peoples are eliminated from the decision-making process, and even the consideration of those making decisions (*See* Peluso, 1993, p. 346; Guha, 1989, pp. 72-73). A letter from the Indigenous Peoples of the Amazon Basin, to several international development banks plead the case of the peoples of the Amazon Basin, who have been and would like to continue to be an intrinsic part of the Amazon biosphere (COICA, 1989, p. 339). In the letter, they list five wants, including recognition and defense of territories and modes of living, and recognition of the rights of indigenous peoples (COICA, 1989, pp. 340-41). The indigenous peoples of the Amazon clearly feel unheard, disrespected, and generally overlooked. These ethical arguments are not disputed here. However, there are also claims that public participation actually increases the likelihood of success in sustainable development programs.

The practicality claims argue that integrated decision-making between the public and program managers increases the public's agency and a program's legitimacy. Legitimacy, in turn, increases the effectiveness through public cooperation. Further, if the public has both agency and a formal stake in the programs success, the public will self-enforce the program.

Citizen participation is justified by its contribution to integrated decision-making (Dernbach, 2003, p. 256). Citizens are important in the process because they will ensure matters of social and environmental concern, of which only locals would be aware, are considered (Dernbach, 2003, p. 256). Additionally, legitimacy can be heightened through stakeholder participation in indicator creation. However, one study concluded that engaging people to select indicators did not need to be initiated from the bottom up as long as "local stakeholder input be allowed to drive the process" (Fraser et al., 2006, p. 126). Thus, the key is to allow enough public involvement in the process.

Building up agency in a community may be important in places where policy implementation requires local people to care. Public participation increases not only legitimacy but also may heighten enforcement through public buy-in, which happens when people have agency. Bürhs states that citizens must have a formal stake (rights) in environmental resources and services if they are to be expected to prioritize protection of the same (Bürhs, 2009, p. 129). This is something to consider as an addition to the potential requirement of agency. Agency without a stake in the environment may produce unpredictable outcomes.

Which Segments of the Public Are Allowed to Participate?

Depending on the program, the public can be defined in many ways. The Rio Declaration and Agenda 21 strongly encourage, or perhaps mandate program councils ensure "stakeholder participation"(Rosenberg & Thomas, 2005, p. 61). This could mean local property owners, businesses, NGOs, or all individuals. The World Commission on Dams was comprised of everyone from dam builders to opponents of dams (Bissell, 2001, p. 167). Some programs even consider community participation, rather than individuals, to constitute the public. "Community agency" is defined as "the construction of local relationships that increase the adaptive capacity of people within a common locality" (Matarrita-Cascante & Luloff, 2010, p. 737). A technology designer also suggests that end user participation in the design process take into consideration "marginalized perspectives" (Oosterlaken, 2009, p. 92).

While some argue that anything less than consensus and total inclusion is not enough, these requirements can be counterproductive. The very values on which we base ideal societies are only reconcilable to some extent and then become contradictory to some extent (Etzioni, 2000, p. 188). Etzioni finds the definition of a community breaks down into "a social entity that has the elements necessary (bonds and shared values) to contain conflict within sustainable boundaries" (Etzioni, 2000, p. 188). All communities, necessarily, exclude some people because exclusion is necessary for those bonds that contain conflict (Etzioni, 2000, p. 189). It is currently unclear whether full community participation ultimately fosters sustainable development more than stakeholder participation (including NGOs).

By What Process Is the Public Allowed to Participate?

Like the different definitions of public, there are also varying degrees of participation included in sustainable development programs. Participation can range from a public comment period, to informed consent to a project, to shared planning of a project. Two requests by the indigenous peoples of the Amazon were participation in project designs to ensure respect of indigenous peoples, and direct relationships of collaboration and mutual respect with international funders on which to base consultations and exchanges (COICA, 1989, pp. 340-41). The participation they request is participation in the design of projects and general collaboration and exchange of ideas with project developers. Whether increased degrees of participation affect sustainable development success is not demonstrated by the literature.

At What Point in the Project Is the Public Allowed to Participate?

The other part of how influential public participation can be is at what point in the project the public is allowed to participate. Another request by the indigenous peoples of the Amazon was that there be no development projects within their areas without prior informed consent of those affected (COICA, 1989, p. 340). It is pointless to ask for consent after a project is designed and ready to go, just as it is pointless to get consent for a project without explaining the potential risks and effects it may have. Public comment periods, for example, typically occur after the entire project has been designed and funded and the organization responsible for implementing it is not likely to make any dramatic changes to the plan based on the comments. Under such circumstances, public participation is more a means of letting people feel included, even though they really cannot make much of a difference.

Though earlier, more meaningful participation, by a greater portion of the public intuitively seems like the most likely route to successful sustainable development, none of the reviewed literature confirmed or denied this proposition.

Role of National Government

There are three important considerations regarding the role and structure of government highlighted by the literature. First, the authority with which a local program is important to their legitimacy and success. Second, vertical integration of sustainable development programs is empowered is also influential. Finally, funding is obviously a factor in any development program.

Development programs must consider the political features of a target population in order to succeed (Lebel & Lorek, 2008, p. 264). Local organizations or municipalities are in the best position to understand such considerations. Therefore, local decisions and implementation are necessary to carryout global policies (Biermann & Pattberg, 2008, p. 284). National planning in a sustainable development plan may indicate a lack of delegated authority or a program poorly suited to the target population.

In addition to local decision-making, vertical integration is a factor of governance to consider. The most important parts of the environmental justice movement are local, regional, and national organizations (Mohai, Pellow & Roberts, 2009, p. 423). Yet, communities and cities rarely get attention in national or international policies (McGranahan & Satterthwaite, 2003a, p. 249). Cooperation between international and domestic politics is needed because sustainable development is not only an environmental issue but also an economic issue (Gallagher, 2009, p. 300). Furthermore, global issues are necessarily also state and local issues (Lee & Stokes, 2009, p. 5). The

results of a multinational survey ranked "insufficient support from national/federal government" as the top obstacle for LA21 implementation, despite the fact that most respondents also said the national government was formally committed to the process (*Second Local Agenda 21 Survey,* 2002, pp. 2-3). Thus, national government involvement of any type should indicate an increased likelihood of success.

There are two funding issues involved in the success of a sustainable development plan: lack of program funding, and funding from special interests. For example, the World Wildlife Federation and African Wildlife Federation helped to fund the acquisition of automatic guns and helicopters to force indigenous people out of their traditional lands under the claim that they were encroaching on elephant territory (Peluso, 1993, pp. 351-52). With NGOs and other special interest groups funding a program, and thus, largely controlling its content, the people affected are not guaranteed a say or any recourse.

Additionally, without a government official with funding ties, it is unlikely a program will last long (Rosenberg & Thomas, 2005, pp. 71-73). Allocation of sufficient funds was the top issue worldwide in the LA21 survey (*Summary of LA21 Survey,* 2002, p. 5). Private interests may fund programs when an issue or area is a hot topic for their donors but then move on to something else as quickly. Dedicated, renewable government funding would be ideal but connection to an official that can secure renewal of funds is a great second. In summary, the literature suggests that vertical integration (i.e. national support), local authority, and government funding are characteristics likely to aid success.

Program Content

Beyond the level, type, and timing of public participation and the degree and type of support from the national governments, the ability of a program to foster sustainable

development may depend on program content. So what does a sustainable development program contain? Before sustainable development, development usually focused on economic goals, and to a lesser extent social goals, like education. Environmental programs often clashed with these goals, however, the sacrifice of the environment eventually leads to economic instability (e.g. due to resource loss) and social ills (e.g. health problems from pollution).

Sustainable development is intended to consider all three aspects of economics, society, and environment but different programs still have different areas of focus. In 2002, results of the second survey to evaluate the progress of Local Agenda 21 (*Second Local Agenda 21 Survey,* 2002) implementation were published. Differences in focus are more closely related to income than region (*Summary of LA21 Survey,* 2002). Communities in mid-income Asian nations and Brazil are likely to have more development goals in common than Brazil and Haiti because of the drastically different income levels of the latter two, for example. Environmental protection was more commonly a focus than social issues in every region (*Summary of LA21 Survey,* 2002). All regions except Asia-Pacific prefer the "sustainable development" approach as an overarching framework for their programs (*Summary of LA21 Survey,* 2002). This approach combines economic, environmental, and social concerns. A look at each follows.

Economic Focus

Economic development is a more common focus in the poorer nations and environmental protection is focused on more as income increases (*Summary of LA21 Survey,* 2002). At a very low GNP, economic development is a high priority because

people need food and shelter, which requires money (*Summary of LA21 Survey,* 2002). Social development as a concern dramatically increases in Mid GNP responses, above either of the two other GNP categories (*Summary of LA21 Survey,* 2002). Logically, this pattern makes a lot of sense. Once certain levels of necessities are met, it becomes necessary to switch the focus to social concerns like education, equity, and health care. Once additional economic growth has occurred, most of these social concerns are alleviated but environmental problems are at an all time high and become the focus of concern. It is not anticipated that economically focused programs will have high success in sustainable development due to the overriding short-term priorities of the communities.

Social Focus

The most common conception of socially focused sustainable development programs is capacity building programs that claim to help people help themselves through education and technology exchange. Such programs have been criticized because they "mostly ignore capacity for research, analysis, and other "upstream" elements of the policy process, which is critical for identifying and analyzing problems and devising practical solutions that take local factors into account" (Sagar & VanDeveer, 2005, p. 15). Moreover, capacity-building programs attempt to construct Southern systems that imitate Northern policies, like the emphasis on market-based mechanisms (Sagar & VanDeveer, 2005, p. 19; Schramm, 2004, p. 104). This causes two problems: unsustainable growth in the South and avoidance of self-reflection in the North (Sagar & VanDeveer, 2005, p. 19). It effectively disregards the social aspect of sustainable development by forcing dominant nations' ideals on less powerful nations.

Another conception of social focus in sustainable development is a "capability approach" in the design world. Oosterlaken uses the capability approach to examine the field of development and design (*See* Oosterlaken, 2009). Explaining the capability approach as conceived by Sen and Nussbaum, Oosterlaken interprets capabilities as the potential of people to do things to improve their well-being (Oosterlaken, 2009, p. 91). Human-centered design, as opposed to technology-driven design, places an emphasis on culture and social values, in addition to economic and industrial interests (Sotamaa, 2009, p. 52). Thus, the design of technology can be a tool to increase capability in sustainable development programs.

Another social focus in sustainable development is the elimination of social ills, such as racism, gender violence, poverty, and crime. Swanger concludes that programs with community building and consciousness raising to value women equal with men are needed to break the cycle of gender violence (Swanger, 2007, p. 116). Likewise, many sustainable development programs are intended to benefit marginalized groups. Certainly, where there are social tensions, failure to address them will result in an unsustainable system. Thus, socially focused programs should be successful at sustainable development, though possibly only by developing social resources.

Environmental Focus

Sustainability requires a paradigm shift from the belief that economics will save us through innovation or price triggers to acknowledgement of the need for ecological sustainability as an end and means of itself (Cairns, 1997, p. 1164). However, a sustainable development program that places environmental concerns above human concerns can be very problematic. Many early environmental preservation programs did

this. As recently as two decades ago an ecotourism program forced local indigenous people out of their territory to increase the "wilderness preservation" and tourism on a newly established game preserve (Peluso, 1993, pp. 350-51). This is one of many cases where the "development" of environmental protection through ecotourism led to social injustice and violence (Peluso, 1993, p. 347). Thus, environment only focused programs have fallen out of favor and are not expected to be successful.

Balance

Social and economic concerns must be addressed with programs that do not compromise the environment. Otherwise, the programs will grow out of their physical limits, which was the trouble with traditional development models. Ross suggests that placing sustainability within ecological terms will ensure that the limits of the Earth are not compromised (Ross, 2009, p. 38). She proposes a system that trades social and economic interests within the designated ecological limits of the Earth (Ross, 2009, p. 47). However, such limits are unknown and likely unknowable.

Sustainable development generally focuses on integrating economic and social development with environmental protection (McGranahan & Satterthwaite, 2003, p. 244; Parris & Kates, 2003b, p. 560; Ross, 2009, p. 34). For example, one author broke down the needs of today into economic, environmental, social, and political domains and the needs of tomorrow into environmental resources, and social/political institutions (e.g. supporting human rights and keeping cultural heritage) (McGranahan & Satterthwaite, 2003, pp. 252-253).

Some claim that trying to balance ecological, economic, and social concerns within sustainability results in trade offs between them (Ross, 2009, p. 37). However,

the purpose of placing them together is to highlight the fact that they affect one another and often trade offs between them do occur, whether it is explicitly stated in the definition of sustainability or not. All areas of the world, regardless of income, prioritize water in their municipal programs (*Summary of LA21 Survey,* 2002, p. 5). It is precisely because of this that sustainable development instead tries to balance the three areas. Thus, sustainable development organizes the three domains in a balancing act, not to create tradeoffs, but to see that tradeoffs are inherent in decisions affecting any of them.

There are many ways to attempt to balance the three aspects of sustainable development presented. The World Commission on Dams determined the first essential step towards an effective review was a fair process with environmental and social concerns on par with economic and engineering issues (Bissell, 2001, p. 168). A study of La Fortuna, Costa Rica's tourism development suggests that there are five dimensions on which to base sustainable development: (1) emphasis on increasing local economic diversity; (2) self-reliance; (3) reduced energy use and waste production; (4) protection and enhancement of natural resources; and (5) social justice (Matarrita-Cascante, Brennan, & Luloff, 2010, pp. 738-39).

The Natural Step Program lists ten goals and their corresponding requisite conditions with number nine focusing on "equity and fairness in resource distribution within human society and with other species" (Cairns, 1997, p. 169). Part of the first condition for this goal makes the claim that "equity and fairness are best achieved at the grassroots level" (Cairns, 1997, p. 169). The claim for grassroots action and the overarching insistence on a paradigm shift is not unique to this author and is part of what has inspired my research question from the beginning. Balanced content and how it is

balanced is an important consideration in sustainable development program success. Theoretically, well-balanced programs are the most likely to be successful.

While the literature reviewed sets out characteristics of sustainable development programs that are likely to succeed in theory, the literature does not analyze existing cases to confirm these theories. In particular, it is necessary to test the following characteristics to determine the influence of public participation: which segments of the public are participating, by what means participation occurs, at what point in the project participation is allowed. Because government role and program content are also likely to affect success of a local sustainable development program, it is also necessary to consider vertical integration or government support, local authority, funding, and how the program goals balance economic, environment, and social aspects.

CHAPTER III

METHODOLOGY

The purpose of this study is to identify factors at local, national, and international levels that facilitate sustainable development in less developed nations. As such, the dependent variable under observation is sustainable development at a community level in less developed nations. In order to identify the factors that facilitate sustainable development literature and case studies on effective sustainable development were analyzed. The common factors identified in the previous chapter are those expected to correlate with sustainable development by scholars.

Before any analysis could be done, it was necessary to identify the variables in measurable terms. In order to find causal factors for sustainable development success, a two-part process was necessary. I first examined correlations between quantified metrics of the independent variables and the sustainable development of the projects. Then, a comparative case study tracing causal linkages between the correlative factors and the success or failure of sustainable development programs in particular communities was performed. A detailed description of this three-part method follows.

Identifying Measurable Variables

Dependent Variable: Sustainable Development Success

The most obvious means of measuring factors would be to use existing indicator sets from other studies. As Chapter II explained, most existing indicator sets for evaluating sustainable development are focused on the national or international level (See Parris & Kates, 2003a). To rank the sustainable development of communities using existing quantitative indicators, it would be necessary to collect community level

indicators. Unfortunately, such data is too inconsistent at this time to reveal true trends, even when supplementing national and regional data for missing information. However, indicator sets generally attempt to cover the three focal areas prevalent in the local planning discourse on sustainable development: social development, economic development, and environmental conservation/restoration (Hibbard & Lurie, 2006, p. 892; See Parris & Kates, 2003c, p. 560). Thus, qualitative data reported in case studies was quantified by theme and aggregated for a total sustainable development score. For examples of the types of qualitative data used to score sustainable development success, see Table 1 in Chapter II.

The dependent variable of success was graded in each of the three areas of sustainable development: environment, economic, and social. Unplanned outcomes were included to rate each factor on a scale of -2 to 2 meaning, very negative (e.g. potentially irreversible damage), negative, no discernable effect, positive, and very positive (e.g. several benefits), respectively. I also create an "Outcome Total" score that sums the scores across the three categories so that negative effects would be balanced against positive effects for an accurate representation of the outcome. Another consideration, however, is how many aspects have a positive outcome. To address this, the "Outcome Mix" sums the number of categories with an overall positive outcome (e.g. negative outcomes in economic and social aspects with a positive outcome in environment would be a one). Grading was compared between cases for consistency.

Independent Variables: Public Participation, Government Role, and Program Content

Determining whether factors that scholars have *argued* promote sustainable development actually do so requires examining whether those factors correlate with the

chosen metric of sustainable development. Although case studies vary in factors that they consider as potential facilitators of sustainable development, there are a number of common factors like public participation, as explained in the last chapter.

The public participation rating was broken down into "population" participating, "means" of participation, and "timing" of participation. The segments of the public making up the "population" were rated 1 to 3, meaning local government, NGOs/stakeholders, and community, respectively. This ranking is intended to show a higher score the more public that is included in the project. One point each was added or subtracted for intentional inclusion or exclusion of women and indigenous peoples. The "population" is displayed separately to identify but is summed in the Participation Total score. The "means" scale ranked implementation, capacity building/training, and planning from 1 to 3, respectively. Where more than one segment of the public participated, the case summary must be consulted to determine which group was involved in each aspect. It reflects a presumed preference for a more inclusive process. The "timing" column assigned 1 to 3 points for after, during, and before implementation. This implies a preference for participation as early in the process as possible. Overall, the public Participation Total reflects the highest scores where participation was inclusive, meaningful, and early. Low scores indicate minimal public involvement, or a facade of participation (e.g. volunteers carry out program after having little or no input).

The government role was rated as 1 for implementation, 2 for planning, and 3 for funding. In this variable, the scores do not reflect a "grade" or preference but simply an arbitrary designation to categorize government involvement. Where the government had

more than one role, the roles are indicated separately, not summed. Thus, if they planned and implemented the table will show "1/2" and two lines will appear on the graph.

Finally, content was scored for each part of sustainable development with points summed for each goal or intended benefit of a program. For economic points, one point was given each for job creation, access to credit/loans, training, market access. For the environmental score, conservation, environmental rehabilitation, and sustainability each received a point. In the social scoring, one point was allocated each for infrastructure development, health care, education, cultural preservation, and community or individual agency building. There were no goals that fell outside of these options. The Content Total reflects the total number of programming goals and the Content Mix displays the number of sustainable development categories addressed by the program goals (e.g. 3 means at least one goal for each aspect of sustainable development). Content Mix was added during correlation analysis and sums the number of areas in which a program had goals.

Correlation Testing

Once the grading scale was created, all potential cases were graded for each factor. Cases lacking enough information to grade each factor were thrown out and the sixteen remaining cases were charted in a table to identify trends. Analysis was then performed through experimental graphical modeling.

Case Selection

In a larger statistical analysis, it would be necessary to control for community, primary industry, political systems, and natural resources. These factors are all potential influences on sustainable development and would need to be made to vary in order for

the sample to represent communities in less developed nations accurately. For the method used here, I sought to consider these differences in the analysis.

All of the local sustainable development case studies that could be found were initially included. Case studies were primarily found through searching databases of journal articles on the university's online library. Key words included "sustainable development" + "case study" and "public participation" + "local Agenda 21" but anything that came to mind and that could pull up case studies of local sustainable development was attempted. A few cases were pulled from readings in related graduate courses, as well. It was more difficult than anticipated to find full case studies of programs, so the purpose was to be as inclusive as possible to begin.

After reviewing over 100 articles, between twenty and thirty case studies were amassed. A few were rejected because they were not focused on local projects or the projects were too recent to evaluate success. Others were eliminated because they simply lacked enough information. The resulting sixteen cases were rated for each of the variables identified above and the ratings were placed in a chart to be analyzed.

Data Analysis

To begin analyzing trends, the ratings data was sorted by the dependent variable and each of the independent variables in turn to identify trends. All factors were graphed together to see the overall trends and any apparent correlations, as well. When comparing the independent variable of content to the dependent variable of success, it seemed that the increase in success correlating to an increase in content might have been a coincidental factor of statistical chance. To account for this possibility, Content Mix

and Success Mix were added. Various options for graphing the data were attempted before the chosen method was settled upon.

To assess whether each independent variable contributed to successful sustainable development, I examined bar graphs of each variable on the X-axis against Outcome Total on the Y-axis. Bar graphs with each bar representing a grouped average were used to minimize small discrepancies in the grading system due to rater error. To analyze government role, cases were divided into each of the four possibilities. The success totals for each group were then averaged. This allows the viewer to see the correlation, or lack there of, between each type of government involvement and the likelihood of success of the program.

Total Participation was graphed in a similar manner but because it does not correspond to any specific meaning, it was grouped by low, moderate, and high participation levels, relative to other cases in the study. Total Participation was also graphed with groups corresponding to negative results, low success, and high success and the vertical axis representing average Participation Total scores, to increase internal legitimacy of the Participation Total graph.

Each part of public participation (which segment(s) of the population, by what process, and at what point in the project) was graphed similarly to government role because each score had a particular meaning. They were graphed so that cases with multiple scores were displayed as such, rather than counting such cases repeatedly in multiple categories. This is useful because a program with multiple scores effectively has more participation, thus, should not be intermixed into the individual types of participation.

Content Total and Content Mix were graphed against Outcome Total and Outcome Mix in a similar fashion, with outcome on the vertical axis. To further explore potential influences of programming, outcome by each content area was graphed, and in each area, success was graphed against the average goals within each category. Finally, participation was graphed against both Content Mix and Content Total. Additional graphing was done in an exploratory fashion, to see what trends presented themselves and to see what trends could be refuted. Much of the exploratory graphing happened simultaneous to the causal analysis phase to affirm or reject alternative theories. All graphs relied on for the findings and conclusions are available in Chapter IV.

Causal Linkages

In the next chapter, I look both at the correlations described and conduct more detailed case studies to assess whether the quantitative correlations are supported by qualitative assessments of carefully chosen pairs of cases. Where a change in factor correlates with a change in sustainable development, historical research was used to describe the change chronologically to look for linkages, as well as other explanations of the change. Logical analysis and counterfactuals were used to determine which factors fostered sustainable development. As each graph displayed correlative factors between independent variables and the dependent variable or between multiple independent variables, pairs of cases that could illustrate each trend were analyzed further to determine if there were alternative explanations for the correlations, or if it would be prudent to conclude influence of a particular variable on another.

Pair Selection

Pairs were selected in each major independent variable category to evaluate their contribution to a program's success in sustainable development. Pairs were examined for differences in as few variables as possible except outcome and/or the independent variable being tested. Theoretically, if two cases were the same except outcome, it would suggest that another independent variable not examined here was at play. If two cases had the same level of success but differed in only one independent variable, it would suggest that the variable was not very influential. If on the other hand, the cases differed in both a single independent variable and the dependent variable, it would indicate that that variable influenced the outcome. Thus, pairs were selected to isolate variables in one of these three orientations. Of course there are always alternative explanations, which is what the detailed analysis is intended to explore.

Detailed Analysis

For each pair of cases, a case comparison was completed. Within each comparison, similarities and differences in programs were considered in detail and alternative explanations for the demonstrated correlation, or lack thereof, were considered. Where alternative theories could be analyzed across all cases, additional graphs were created. Where alternative theories could not be proven or dismissed with the data available, conclusions were left tentative with further research suggested.

CHAPTER IV

FINDINGS

To evaluate the correlation of factors commonly believed most relevant to successful sustainable development, numerous cases of sustainable development programs were examined. Sixteen cases contained enough information to grade the dependent variable of outcome success, and the three independent variables of public participation, government role, and program content. They were then matched up based on similarities in order to isolate each independent variable as much as possible. Pairs were then compared to further analyze correlations and attempt to derive causal linkages.

Table 2 displays all sixteen cases that were rated. The Outcome Total ranged from -2 to 6 with an average of 2.63. Two cases had an overall negative result and one had no significant effect, positive or negative. Of the remaining thirteen cases with positive effects, seven were moderately successful (2 to 3) and six were highly successful (4 to 6). Results for each independent variable are presented followed by the overall trends observed.

Table 2. Scores for sixteen viable cases

	Program	Place	Government	Public Participation				Content					Outcome				
			Role	Population	Means	Timing	Total	Economic	Environment	Social	Total	Mix	Economic	Environment	Social	Total	Mix
1	3 yr Fish Restoration	Xochimilco wetland, Mexico	3	3/2	1	2	8	2	1	0	3	2	1	1	0	2	2
2	Maya Herbal Remedy Collection	Maya ICBG, Chiapas, Mexico	0	3	1	3	7	1	1	1	3	3	0	1	1	2	2
3	Rural Energy Generation	Cuba	3/2	2	1	1	4	1	1	2	4	3	1	0	2	3	2
4	Microloan Development Bank Program	India	0	3	3/2	3	11	1	0	1	2	2	2	0	2	4	2
5	Reef Based Ecotourism	Ambergris Caye, Belize	2	2	1	2/1	6	2	1	0	3	2	1/-1	0	-2	-2	0
6	Reef Based Ecotourism	Punta Gorda, Belize	0	3	2/1	3/2	11	3	2	1	6	3	1	1	0	2	2
7	Sustainable Tourism Development	La Fortuna, Costa Rica	1	3	3/1	3/2	12	3	2	5	10	3	2	2	2	6	3
8	Social Foresty	Java	3/2/1	3-1	1(3)[1]	2(3)	5	2	2	0	4	2	-1	1	-2	-2	1
9	ECOBONA Sustainable Forest Management	Peru	1/3	3/2/1	3/1	2	12	1	1	1	3	3	2	1	2	5	3
10	ECOBONA Sustainable Forest Management	Bolivia	1	3/2/1	3/1	2	12	1	1	1	3	3	2	2	1	5	3
11	ECOBONA Sustainable Forest Management	Ecuador	1	3/2/1	3/1	2	12	2	1	1	4	3	1	1	2	5	3
12	FOSEFOR Native Seeds Initiative	Peru	0	2	1	2	5	2	0	0	2	1	1	1	0	2	2
13	FOSEFOR Native Seeds Initiative	Bolivia	0	2	1	2	5	2	0	0	2	1	1	0	1	2	2
14	FOSEFOR Native Seeds Initiative	Ecuador	0	2	1	1	4	1	1	0	2	2	0	0	0	0	0
15	INCOPA Native Potatoes Initiative	Peru	0	2	1	2	5	2	0	1	3	2	2	0	1	3	2
16	AGRUCO Agrobiodiversity Education	Bolivia	2	2/3+1	2/1	2	11	1	1	2	4	3	1	2	2	5	3
	Means/Modes[2]		0	2	1	2	8.13	1.69	0.94	1.00	3.63	2.38	1.07	0.81	0.75	2.63	2.00

2. Modes are displayed without decimal points and are used in the columns where the numbers designate a particular answer that would mean little if averaged together. The means are displayed rounded to the nearest hundreth.

1. Numbers in parentheses are the intended participation levels but the program actually had the number outside the parentheses

Public Participation

The Participation Total anticipates that more meaningful participation, earlier in the process, and with more of the public involved will generally lead to more results that are successful. Figure 1 confirms that high levels of participation correlate with more outcomes that are positive. Cases were divided by Outcome Totals, into those with no positive outcomes, moderately positive outcomes, and highly positive outcomes (Figure 3).

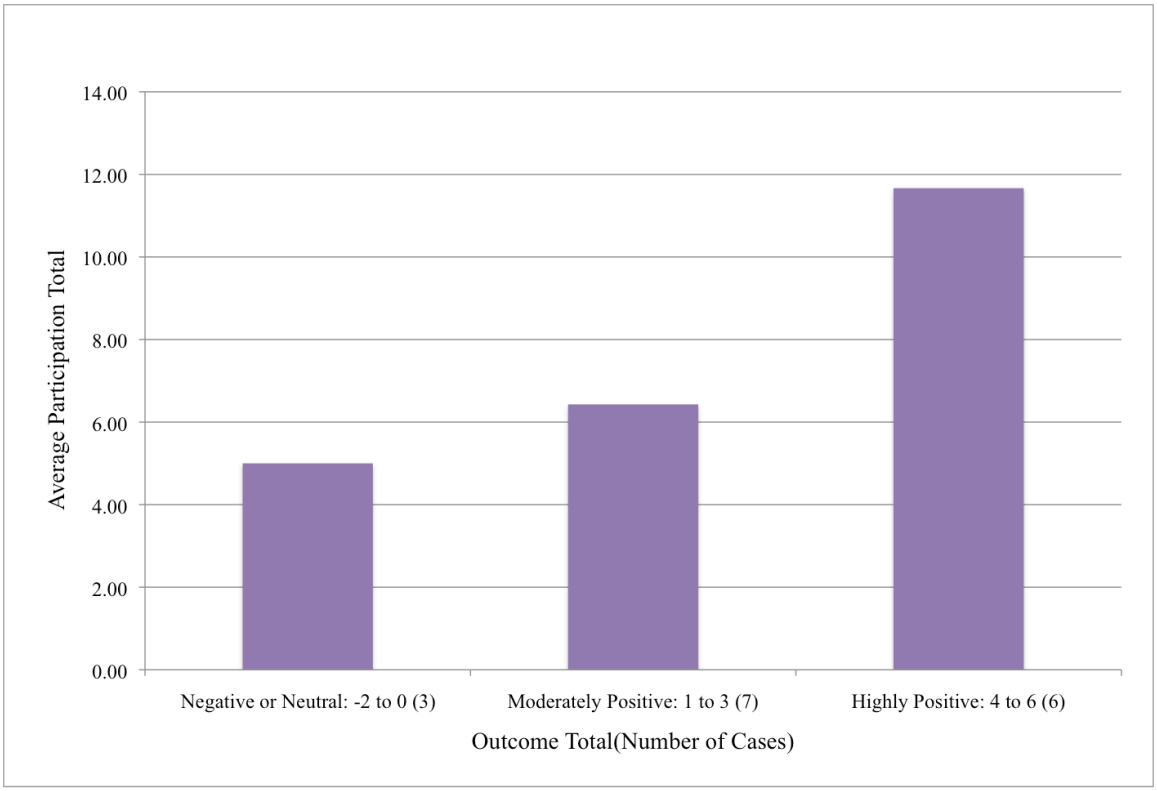

Figure 1. Participation Total compared to Outcome Total

Another method used to verify the validity of this positive correlation was to simply look at the cases with the top outcome scores. The Participation Total is consistently high across the most successful programs. In the six highest performing programs, the community participated and in five of these, participation was in the

planning stage. Similarly, the majority of low performing programs had low Participation Totals with implementation as the only means of participation, in most cases. The same trend is shown in the last segment of Figure 2, where the cases are divided into low, medium, and high Participation Totals. To determine low, medium, and high scores, the range of scores (4-12) were evenly divided in thirds.

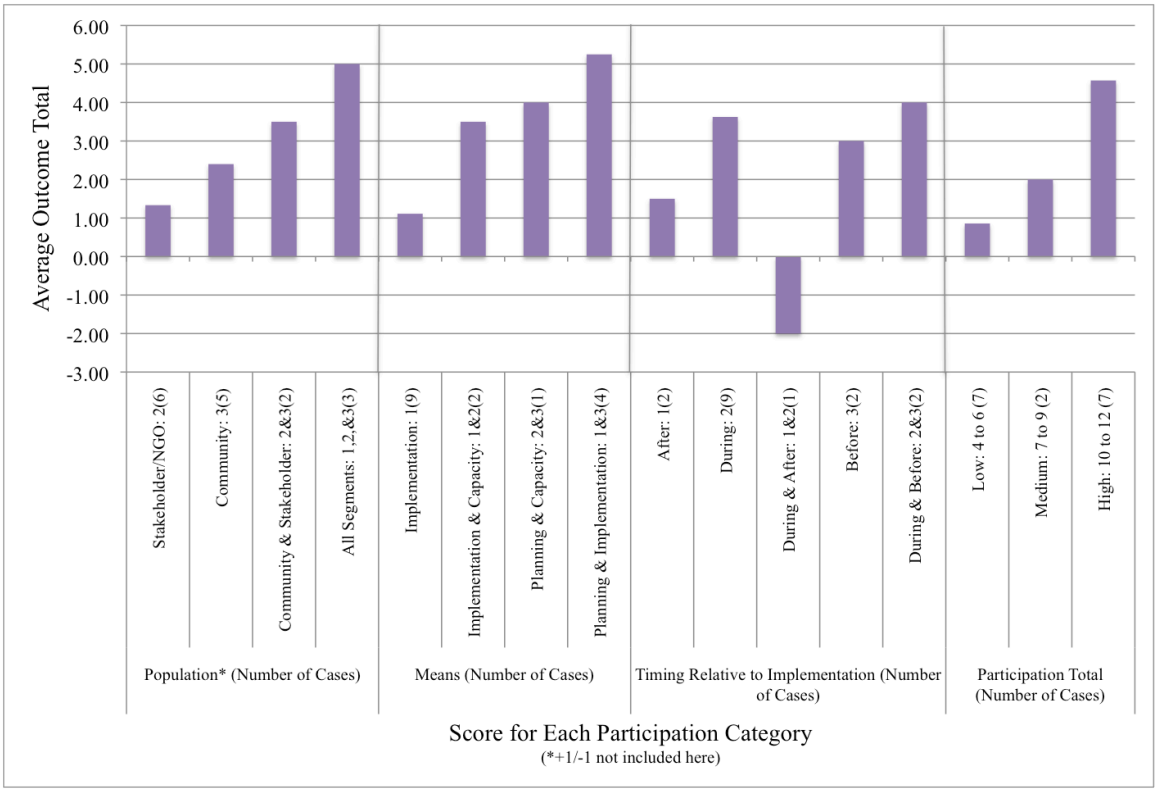

Figure 2. Participation compared to Outcome Totals

At What Point in the Project

It was anticipated that earlier involvement would be more successful due to people having more agency and ownership of the programs. Only four programs had early participation and three were moderately successful, while one was highly successful. All of the other highly successful programs had participation only during implementation and the majority of cases (10) allowed participation only during implementation. Thus, it is not prudent to conclude that participation during

implementation is more likely to result in success; only that most cases studied here only had participation during implementation. Figure 2 shows some correlation between earlier participation and total outcome but with nearly all the cases in a single category, it is not strong and was not analyzed further.

By What Means

It was anticipated that a more meaningful role by participants would correlate with a more successful outcome and Figure 2 suggests the same. Just over half the cases allowed participation in implementing the project and all but one allowed participation in that manner. When broken into cases by method of participation incorporated in a project, an increased average outcome is seen from implementation only to implementation and capacity building, to implementation and planning, with a decline for capacity building and planning without implementation. Only one case did not include implementation as a means of participation, so the decline may be a fluke. Where there is implementation by participants, it is clear that the additional ability to participate through capacity building and training or in planning may contribute to the success of the program.

Which Segments of the Public

All cases considered in this study had participation from some form of the "public" including NGOs, stakeholders (e.g. business owners), and/or community members. NGOs and stakeholders were grouped together because both groups generally claim to represent the communities' interests but are only a proxy for actual community involvement. However, NGOs may also provide support to a program that the

government is unable or unwilling to provide. This was not accounted for in the present study but is discussed in the particular cases illustrations.

It was anticipated that participation by more people, and at lower levels of organizations, would correlate with higher outcomes. Figure 2 shows a positive correlation as anticipated. It should be noted, however, that all three cases in the far right column are ECOBONA programs implemented in three different countries. They are also the only cases where local government participated as stakeholders. Caution should be used when drawing any conclusions from that column but the trend in Figure 2 supports the notion that involvement of more segments of the public promotes sustainable development. Community participation seems more important than NGO or stakeholder participation but multiple segments of the public involved constitutes an even more likely path for success.

Segments of the Public Participating & By What Means

To further consider the influence of different types and levels of participation, I compare a relatively unsuccessful case with stakeholder participation in implementation and a successful program with stakeholder and community participation through implementation and capacity building.

Case 5: Ecotourism in Ambergris Caye, Belize

This case was taken from a study of a tourism development plan on the largest Belizean island (Moreno, 225). The study focused on local communities' ability to derive benefits from ecotourism. Coastal waters with their corals and sea grass beds are primary attractions to tourists (Moreno, 226). Tourism increased dramatically after the mid 1980s and ecotourism was promoted in the Belize National Development Plan of 1990

(Moreno, 226). Foreign investment on the island was substantial before the plan and there was little control over development (Moreno, 227). Most Belizeans were not able to afford to buy land so the government restricted purchase of land by foreigners to a permitting process in 1992 (Moreno, 227). However, enforcement has been lacking. There is concern over the destruction of mangrove stands and groundwater pollution due to shoreline development and waste disposal (Moreno, 228). Additionally, increased snorkelers in the mid 1990s caused damage to the shallow corals (Moreno, 228).

The government requested the UN Development Program develop a master plan for the island's development to promote tourism expansion while protecting the character and environment of it (Moreno, 226). Due to the government's request, a planning scheme was created with control by a committee of both islanders and mainlanders (Moreno, 226-27). The committee does not have authority to make rules regarding land ownership or consumptive resource use, only to establish and enforce zoning and architecture guidelines (Moreno, 230). The plan established different usage districts that concentrate growth in San Pedro and the center of the island (Moreno, 227).

Social concerns have surfaced over the tourism planning. Traditional fishing culture has waned while tourism culture has increased, especially amongst the younger generation and the number of foreign owned businesses has increased, creating dependence on foreign employers (Moreno, 228). Local children are adopting the styles and values of foreigners (Moreno, 228). There has been an influx of mainlanders and foreigners looking for work, as well (Moreno, 228). About half the locals feel tourism has had negative social impacts (Moreno, 228). However, most locals also feel there have been widespread economic benefits (Moreno, 228). Designation of marine reserves

have had limited ability to protect the environment because they still allow access to commercial tour operators, just with a fee (Moreno, 229). Additionally, the vast majority of residents have lost their ability to own land on the island due to increased land values, taxes, and development costs (Moreno, 230).

In summary, this case study demonstrates substantial direction by the national government and stakeholder participation during implementation but little local authority with some economic benefits, some economic and social harms, and no environmental effects.

Case 17: Proyecto Agroecología Universidad Cochabamba (AGRUCO) in Bolivia

AGRUCO created a center in the University of San Simón meant to develop and diffuse sustainable agro ecology methods in Latin American universities (Baudoin, 4). The University pays for personnel but the program has been able to acquire a lot of funding from outside sources, as well (Baudoin, 22). Many NGOs in Bolivia have a tense relationship with the government but AGRUCO is acknowledged and accepted (Baudoin, 22). The center promotes inclusion of traditional knowledge in academics and work with families to promote agro-biodiversity through education on resource use and attitudes. AGRUCO built a storage facility for seed and product storage and supported reforestation of areas where trees could grow (Lafontaine et al., 42; Baudoin, 14). Using participatory research and indigenous knowledge, AGRUCO trains and supports local people through programs with municipalities and rural grassroots organizations (Baudoin, 4). It focuses on training agricultural professionals to understand the needs of local populations and conservation (Baudoin, 7).

Focus groups responded to the program with positive points. Observations included that there was increased agricultural biodiversity in all five communities and reduced forest conversion and degradation in one (Lafontaine et al., Annex, 36). The income change for beneficiaries ranged from 15% to 300%, with most around 40-70% (Lafontaine et al., Annex, 37). Resource use changes included fewer pesticides, better storage of seed and produce, greater variety of potatoes, and diversified production (Lafontaine et al., Annex, 38). Socially, traditional knowledge, reductions of chemical exposure, and resource management has become more important in all five communities (Lafontaine et al., Annex, 40). Two communities also started managing tourist resources (Lafontaine et al., Annex, 40).

Use of organic methods to produce Huaycha potatoes (a native species) increased production by 300% (Lafontaine et al., 42; Baudoin, 13). Shifting to organic fertilizers and reducing pesticides improved quality of produce and reduced costs to farmers (Lafontaine et al., 42; Baudoin, 14). Results: more conscious of health risks of chemicals, better clothing for families, more quality education for children because can afford materials and longer schooling, family diet more diversified, better use of medicinal plants due to maintenance of traditional knowledge (Lafontaine et al., 42; Baudoin, 14).

AGRUCO's program increased the university's ability to deliver academic services based on the questioning of the green revolution (Baudoin, 16). By reducing habitat destruction through sustainable agriculture practices, AGRUCO is supporting conservation of biodiversity (Baudoin, 20).

Comparisons

Table 3 summarizes the case comparison. The addition of participation by the community segment of the public and capacity building significantly increased the success of the program planned by the government. It is also necessary to note that the more successful program had social goals, making the content differ.

Table 3. Participation Case Comparison

Case #5 – Ecotourism in Belize	Case #17 – Agrobiodiversity Education in Bolivia
Government planning.	Government planning
NGO/Stakeholder participation in implementation during project	NGO/Stakeholder and community participation in implementation and capacity building during project
Focus on economic and environmental aspects	General goals of poverty reduction, socioeconomic development, and biodiversity. Focus on all three aspects
No environmental effect, positive and negative economic effects, very negative social effect	Success in all three aspects

Government Role

The government role does not seem predictive of overall outcome success. Figure 3 indicates that government role is not correlative with outcome either positive or negative. There is a fairly even spread of cases in each government role. Results range 2.8 points, with programs planned by the government averaging the lowest results and those implemented by the government averaging the highest results. In the middle, with only a .14 difference in outcome averages, are those without government input and those funded by the government.

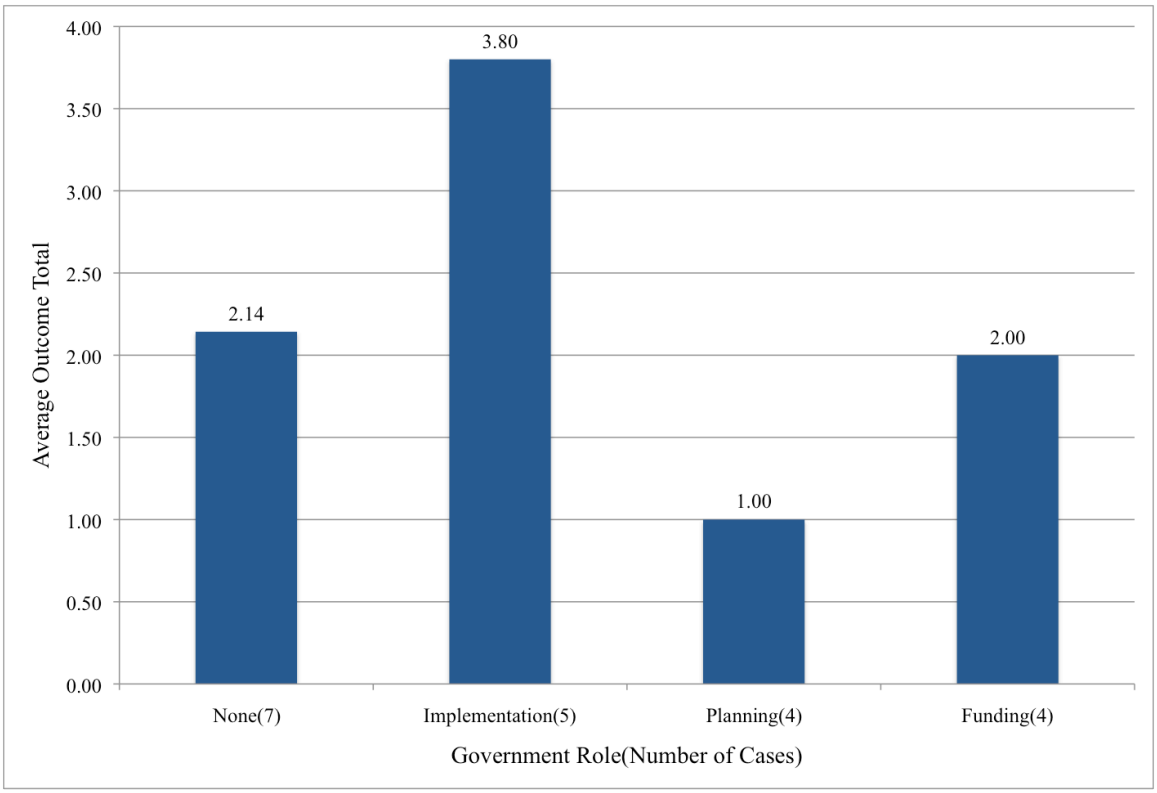

Figure 3. Government Role compared to Outcome Total

Vertical Integration without Local Authority: Government Planning

Government Planning indicates vertical integration but a lack of authority of local stakeholders or municipalities. Government planning had a low average because two of the four cases had negative results. The two with positive results include an energy project in Cuba and an education program in Bolivia. The Cuba project may have had moderate success because of the highly centralized political system of Cuba. It also is the only one of the cases involving an energy generation installation, which is a highly technical and specialized project to plan and build. It would not have made a lot of sense to involve local farmers much in the design or construction of the project. Success of the program in Bolivia may also be attributed to its exceedingly high public participation score with community members participating in the planning compared with the other

three cases, which had participation only in implementation and only by stakeholder, NGOs, or a segment of the community (men only).

Vertical Integration with Local Authority: Government Implementation

Four of the five cases with government implementation also had community planning. Therefore, it is not clear that government assistance in implementation is as significant as Figure 3 would suggest. It may be the community planning that made this subgroup so successful. This is further supported by the fact that the one negative case with government implementation was intended to have community input, but in practice, was planned by government agents instead.

Of the five programs where the government was involved in the implementation, three were ECOBONA projects, which means they were essentially the same project carried out in three different countries. Their similar success scores suggest that the political and cultural differences amongst Peru, Bolivia, and Ecuador do not significantly affect sustainable development program outcomes.

Government Funding

It seems that in most cases of success without government assistance, however, an NGO with outside funding took on roles that filled in for the government. At least six of the seven without government input were funded by NGOs, suggesting that NGOs funding a project step into the role of the government, producing similar results.

The ECOBONA cases in Peru and Bolivia (cases #10 & #11) demonstrate that when all things are constant except location and government funding, no change in outcome was found. The Fish Restoration and Mayan Herbal Remedy projects (cases #1 & #2), both in Mexico, demonstrate that government funding was not necessary for

success, as both had moderate success with the primary differences being government funding and program focus. However, the nongovernment-funded program was funded through alternate channels. In fact, at least six of the seven cases without government involvement were funded by NGOs, suggesting that NGOs may step into the role of the government and produce similar results.

Vertical Integration without Local Authority v. No Government Involvement

It was expected that programs with vertical integration and locally delegated authority (i.e. government implementation but not planning) would be more likely to succeed than others. It was also expected that vertical integration without locally delegated authority (i.e. government planning) would facilitate less successful programs but it was not expected that programs with no government involvement would be more successful than these. Here I compare a case with vertical integration but no locally delegated authority to one with no government involvement.

Case 5: Ecotourism in Ambergris Caye, Belize

This case, described in more detail in the participation section above, was taken from a study of tourism development in Belize (Moreno, 225). Ecotourism was promoted in the Belize National Development Plan of 1990 (Moreno, 226). Foreign investment on the island was substantial before the plan and there was little control over development (Moreno, 227). Most Belizeans were not able to afford to buy land so the government restricted purchase of land by foreigners to a permitting process in 1992 (Moreno, 227). However, enforcement has been lacking.

The government requested the UN Development Program develop a master plan for the island's development to promote tourism expansion while protecting the character

and environment of it (Moreno, 226). Due to the government's request, a planning scheme was created with control by a committee of both islanders and mainlanders (Moreno, 226-27). The committee does not have authority to make rules regarding land ownership or consumptive resource use, only to establish and enforce zoning and architecture guidelines (Moreno, 230). The plan established different usage districts that concentrate growth in San Pedro and the center of the island (Moreno, 227).

About half the locals feel tourism has had negative social impacts, including a waning traditional fishing culture, an increased number of foreign owned businesses and dependence on foreign employers, children adopting values of foreigners, and increased competition from mainlanders and foreigners (Moreno, 228). Additionally, the vast majority of residents have lost their ability to own land on the island due to increased costs (Moreno, 230). However, most locals also feel there have been widespread economic benefits (Moreno, 228). Designation of marine reserves has had limited ability to protect the environment (Moreno, 229).

In summary, this case study demonstrates substantial direction by the national government and stakeholder participation during implementation but little local authority with some economic benefits, some economic and social harms, and no environmental effects.

Case 16: Proyecto de Innovación Tecnológica y Competitividad de la Papa (INCOPA) in Peru

Two communities in Peru hosted this program. Primary interventions were in the upper highlands and Lima (Fuentes & Elgegren, 6). INCOPA partnered with the Ministry of Agriculture and several NGOs (Fuentes & Elgegren, 7). This is a program to

promote native potatoes to improve highland farmers livelihoods (Fuentes & Elgegren, 4). Designed to improve access to markets and diversify livelihoods by linking small farmers to urban markets (Fuentes & Elgegren, 4). The dual benefit hoped for was higher, more predictable incomes for highland farmers and increased access to native potatoes by urban consumers (Fuentes & Elgegren, 4). INCOPA provided technical assistance in planting and marketing, and helped farmers recover after severe weather (Fuentes & Elgegren, 14).

The value of sales tripled in Huánuco according to INCOPA's impact assessment but only increased by 15% by other estimates (Fuentes & Elgegren, 13). Productivity for farmers and access to potatoes in Lima has increased (Fuentes & Elgegren, 13). This may benefit the urban poor who suffer from chronic malnutrition (Fuentes & Elgegren, 13). Quality of life has improved for some farmers, allowing them to have more livestock and better housing and diets, and more ability to send their children to school (Fuentes & Elgegren, 13-14). Potato consumption in Lima has increased (Fuentes & Elgegren, 14). A new law, fostered by INCOPA, will result in reduced product loss during transportation, easier classification, and fewer injuries to porters once it is enforced (Fuentes & Elgegren, 17)

The Cayna Community reported that the project supported increased use of native potato varieties but the Llave Community reported no change and the area was already quite degraded (Lafontaine et al., Annex, 36). Both communities increased income by 37% and 100%, respectively (Lafontaine et al., Annex, 37). Cayna became more sustainable through increased consumption of potatoes, and the increased income allowed the community to invest in agricultural activities (Lafontaine et al., Annex, 38). Llave

had better access to marketing and packaging resources with higher incomes (Lafontaine et al., Annex, 39). Both communities improved the structure to market and sell their products (Lafontaine et al., Annex, 40).

Comparison

Table 4 summarizes these two cases. When stakeholders only implement and economic goals are primary, government planning fostered sustainable development less than when the government was not involved. Both programs had public participation in stakeholder implementation during the program. Both had two economic goals and Ecotourism in Belize had one environmental goal, while Agrobiodiversity in Peru had one social goal.

Table 4. Government Role Case Comparison

Case #5 – Ecotourism in Belize	Case #16 – Agrobiodiversity in Peru
Government planning.	No government involvement but cooperation
NGO/Stakeholder participation in implementation during project	NGO/Stakeholder participation in implementation during project
Focus on economic and environmental aspects	General goals of poverty reduction, socioeconomic development, and biodiversity. Focus on economic and social aspects.
No environmental effect, positive and negative economic effects, very negative social effect	Success in economic and social aspects

Agrobiodiversity in Peru succeeded in its goals, while Ecotourism in Belize had positive and negative economic effects, no environmental effect, and very negative social effects. The primary difference is government involvement. Other considerations include national issues and relative simplicity of Agrobiodiversity in Peru. Overall, this comparison suggests that vertical integration without local authority to affect change, as demonstrated by the strong government influence in the Ecotourism program, is less successful than programming without vertical integration but with local authority over

the program. However, the more successful program also had a social goal, which may foster sustainable development more than other goals, as discussed in the next section.

Content

Content was analyzed for its total number of goals, its primary focus (economic, environmental, or social), and for its mix of goals. This can be expressed as three questions: 1. Are better outcomes simply a function of a greater number of goals?; 2. Are economic, environmental, or social goals equally likely to succeed, and thus contributing to outcomes in proportionately?; 3. Are programs more successful when they have goals in each of the three aspects of sustainable development?

Number of Goals

The variable of Content Total does not appear to foster sustainable development, as displayed in Figure 4. While there is a slight increase in outcome averages between two and four goals, the program with six goals did not fair as well and the program with ten goals had the maximum success score. Both of these programs were tourism related with very high participation and goals in all three aspects of sustainable development. The more successful program had government implementation and four more social goals than the moderately successful program.

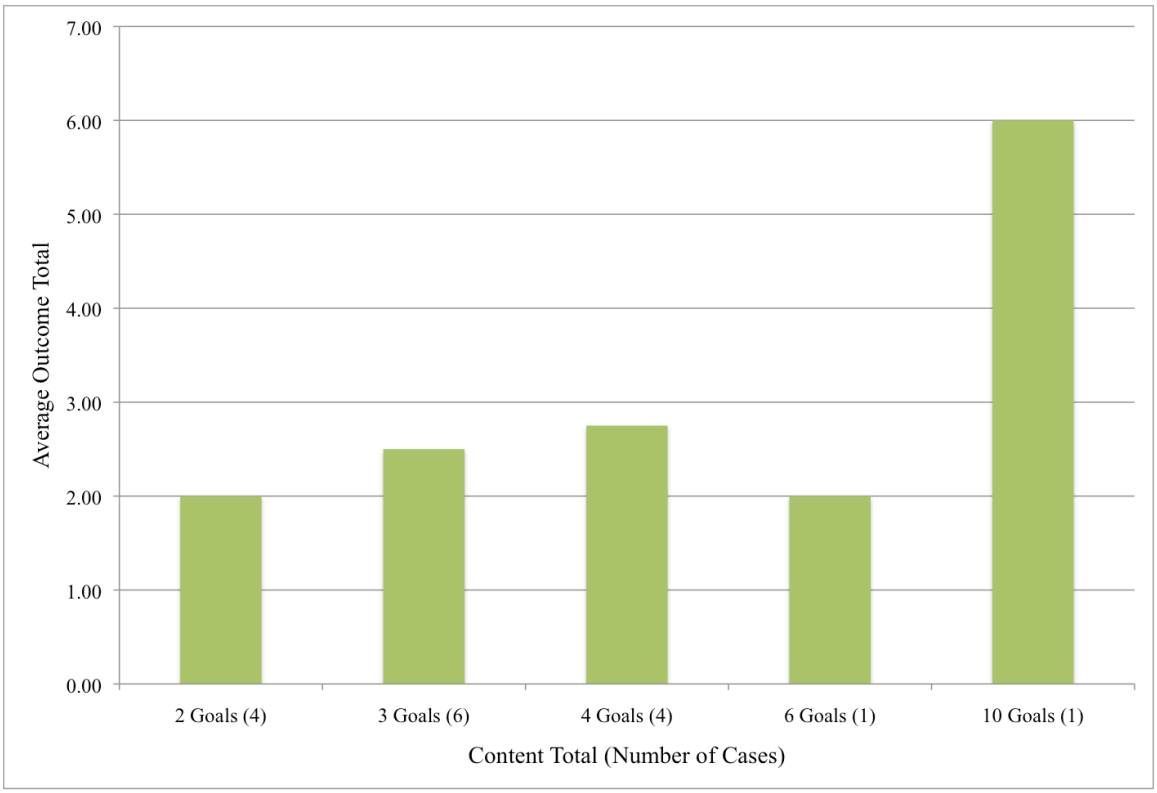

Figure 4. Content Total compared to Outcome Total

Focus of Goals

When looking only at the goals in each category compared with the outcome in each category, as in Figure 5, it seems a larger number of social goals is directly correlated with higher scores in social outcome. Environmental goals show a less pronounced correlation, and economic goals do not correlate with positive economic outcomes at all. Thus, social aspects of a program are likely to increase the success of a program disproportionately to other aspects.

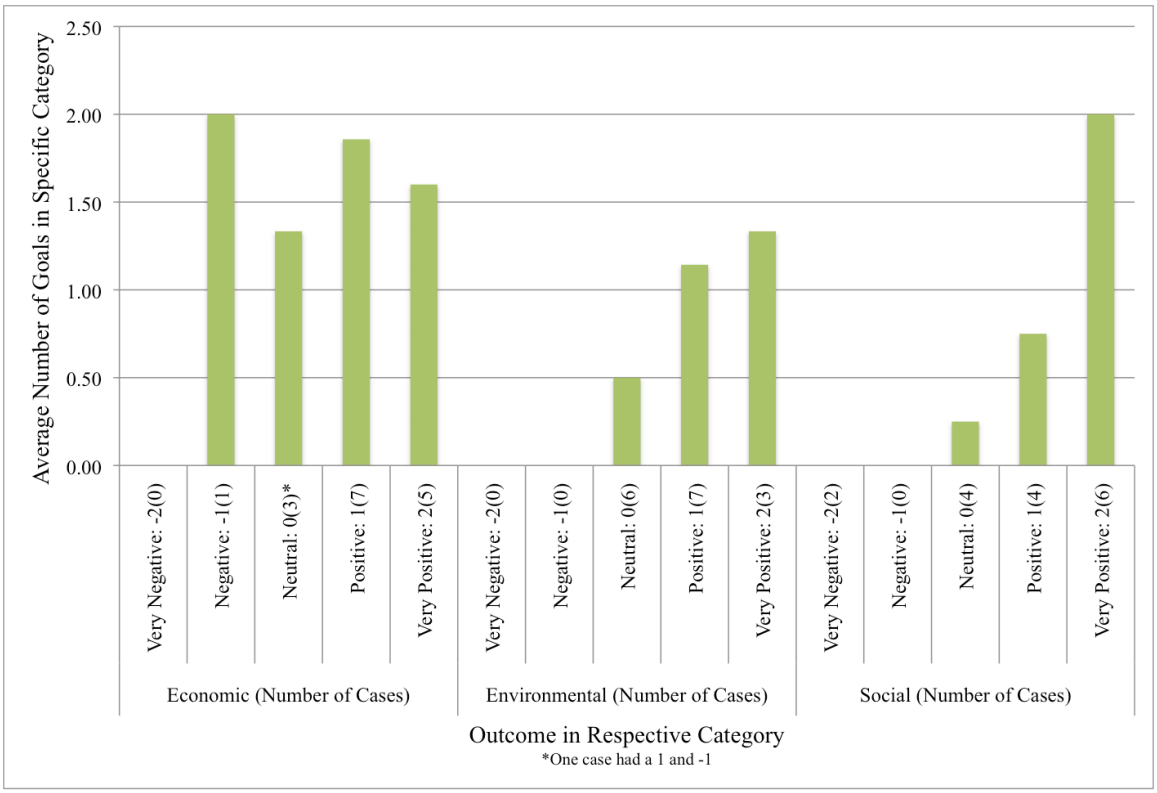

Figure 5. Content total of each category compared to outcome in the respective category

When the sum of each aspect's outcome is graphed (Figure 6), it is clear that economic and social success make up the largest portions of success. Negative social effects are more prevalent than negative economic effects in this case sample, and no negative environmental effects were reported (though often negative environmental effects are not immediately apparent). It seems that, although social goals are more directly correlated with positive effects than either economic or environmental goals, positive social outcomes are not disproportionately represented in the overall outcomes. Thus, social goals are correlated with more outcomes that are positive.

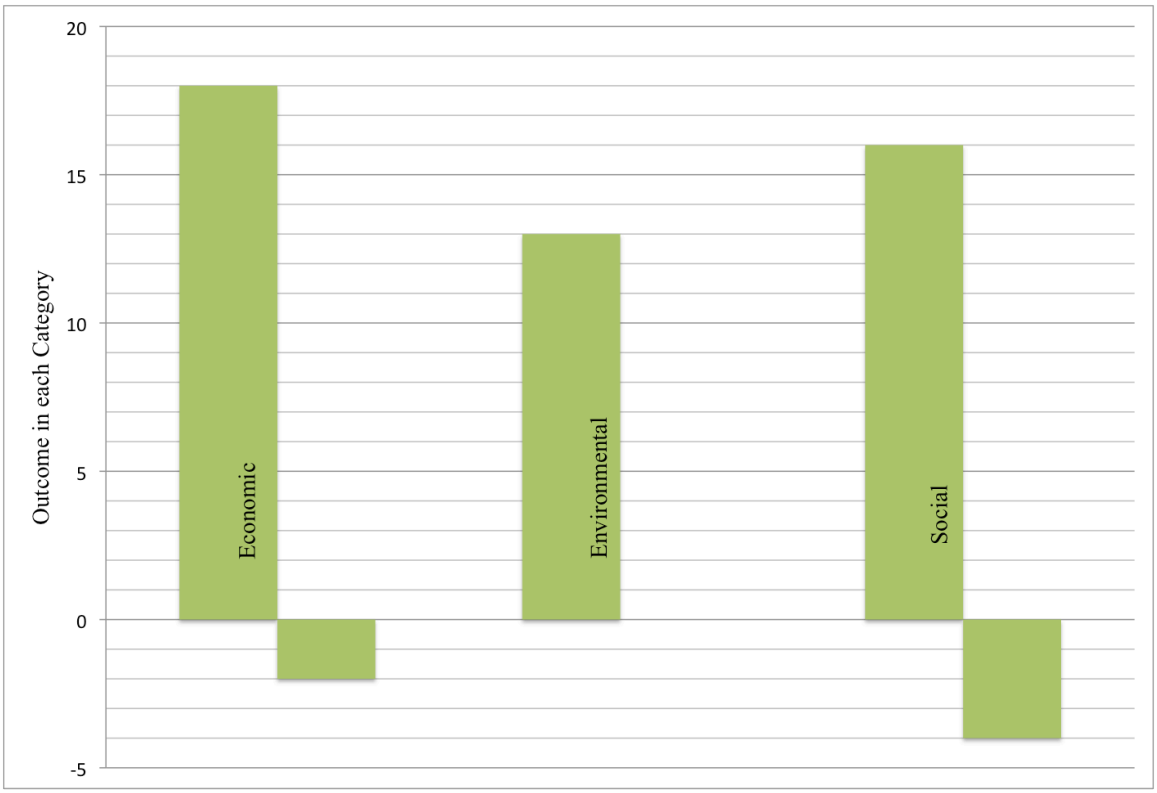

Figure 6. Sum of outcome in each content category

Content Mix of Goals

The final consideration is whether programs with goals in all three aspects are more likely to succeed than those with goals that do not address all three aspects of sustainable development. Figure 7 compares the Content Mix with the average Outcome Totals. The most successful programs addressed all three aspects of sustainable development, while the least successful only included two elements in their goals. While the two cases that addressed only one aspect of sustainable development fared better on average than the six cases with goals in two areas, the eight programs with goals in all three aspects (true sustainable development programs) performed more than twice as well on average than the others. This suggests that the three areas of sustainable development do in fact complement one another.

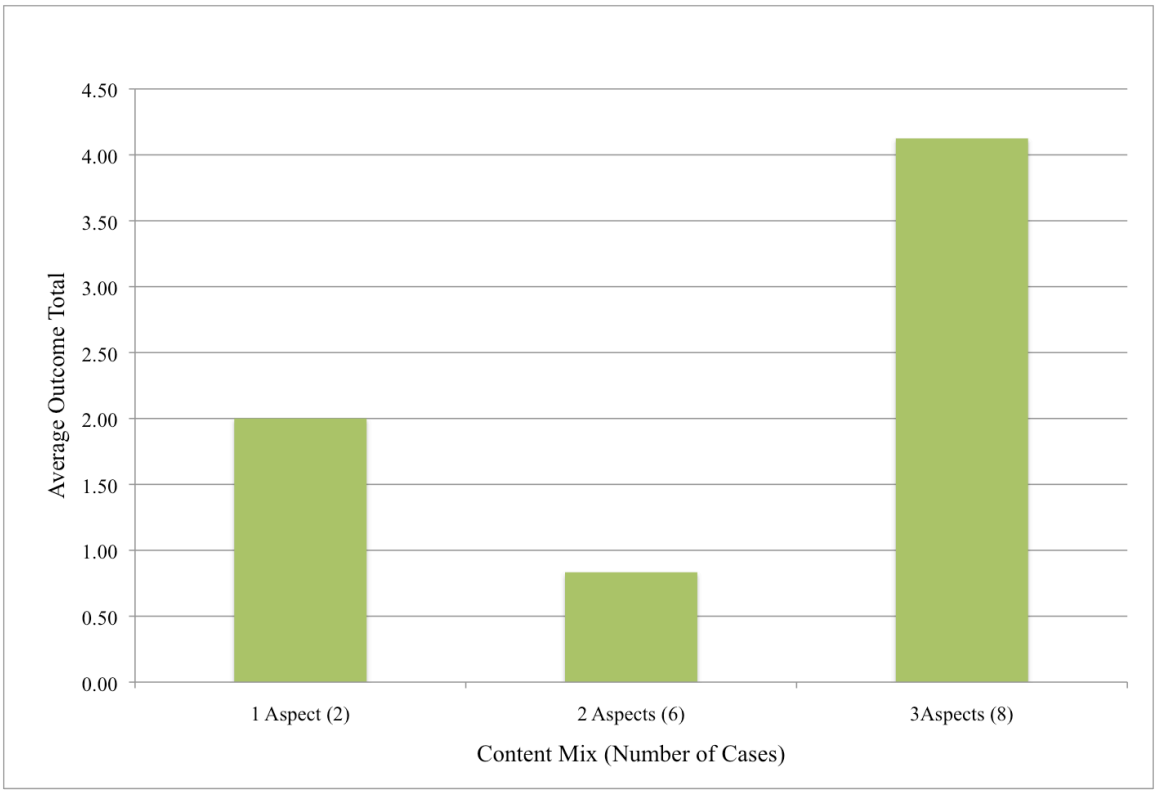

Figure 7. Content Mix compared to Outcome Totals

However, the average participation also steadily increases as the Content Mix increases (Figure 8). How much success can be attributed to Content Mix and how much is attributable to participation would be difficult to identify with the data collected for this study.

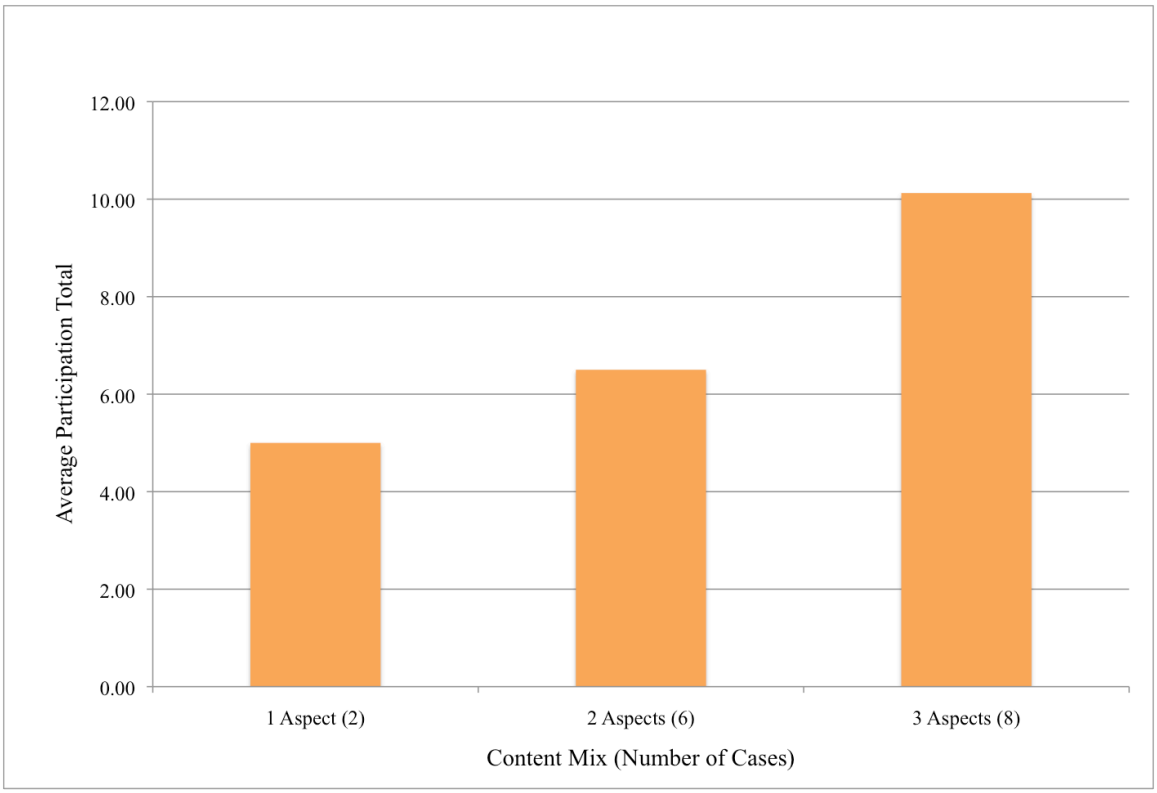

Figure 8. Content Mix compared to Participation Totals

Successful Projects

Previous sections evaluated the contribution of individual factors to successful sustainable development. This section alternatively looks at three successful programs to identify the common factors amongst them.

Case 7: Sustainable Tourism in La Fortuna, Costa Rica

La Fortuna is "one of the most visited nature-based tourism destinations in Costa Rica" (Matarrita-Cascante, 739). La Fortuna is hailed as a flagship of sustainability, which is largely attributed to local ownership and management of the tourism industry (Matarrita-Cascante, 740). The study used here assessed the economic, social, and environmental goals in relation to agency with a focus on participation.

Over the past 30 years, the community's economy has shifted to tourism and experienced rapid economic and population growth (Matarrita-Cascante, 740). The main

community organization involved in development is the Asociación de Desarollo Integral de La Fortuna or the Association of Integral Development of La Fortuna (ADIFORT) (Matarrita-Cascante, 740). As tourism related problems occurred, the government was unable to respond to the community's needs so ADIFORT and the local government worked together to address such issues (Matarrita-Cascante, 744). ADIFORT is funded by entrance fees for a local waterfall and local rental properties (Matarrita-Cascante, 740).

Common areas where the community can interact and communicate are important to this outcome according to residents (Matarrita-Cascante, 743). Through ADIFORT and other community organizations, the community of La Fortuna has enjoyed broad participation by the community in entrepreneurial activities and land management through community wide decisions not to sell land to foreign investors but develop the tourism projects themselves (Matarrita-Cascante, 744).

ADIFORT was created by local residents and business owners as one of several organizations intended to protect water quality and the environment and improve the local quality of life (Matarrita-Cascante, 743). At the same time, residents recognized the importance of a diverse economy and many continued their traditional activities while developing tourism related enterprises (Matarrita-Cascante, 745). The tourism sector is predominantly small family owned businesses (Matarrita-Cascante, 741). This has resulted in a good spread of economic benefits in the community (Matarrita-Cascante, 746).

The community has also responded to social changes from tourism through programs aimed at established social goals (Matarrita-Cascante, 746). ADIFORT has

financed several of these projects through loans and donations (Matarrita-Cascante, 747). At the time of the study, ADIFORT was in the process of constructing a sewage treatment facility and water treatment plant (Matarrita-Cascante, 747). ADIFORT has improved the school facilities in a marginalized neighborhood, helped pay resident's electric bills, and assisted low-income pregnant women, in addition to installing street signals and providing resources to local law enforcement (Matarrita-Cascante, 747). Other community organizations have implemented environmental education and protection programs (Matarrita-Cascante, 747). Residents claim to have learned to appreciate nature since the programs began (Matarrita-Cascante, 749).

Cases 11 and 12: Regional Program for the Management of Andean Forest Ecosystems (PROBONA/ECOBONA) in Bolivia and Ecuador

Bolivia

ECOBONA has widespread programming in Bolivia with about 86 communities participating in total. The typical responses of the communities are used for this case study. In Bolivia, ECOBONA works in close connection with communities and municipalities in efforts to build capacity, particularly in conservation and communal norms (Baudoin, 12). ECOBONA is the continuation of PROBONA, both are programs intended to build capacity to improve forest management and introduce alternative livelihoods to forest dependent communities (Baudoin, 5).

In Bolivia, PROBONA/ECOBONA reduced forest conversion and degradation and reforested in a few communities (Lafontaine et al., Annex, 36-37). Income increased by up to 10% (Lafontaine et al., Annex, 37-38). Many communities also reported reduced coal extraction, protection of water, reduced erosion, diversified production, and

the exclusion of other communities from use of their grazing areas (Lafontaine et al., Annex, 39). This last factor was largely due to introduction of communal management of natural resources and a greater sense of community ownership of forest areas (Lafontaine et al., Annex, 41; Baudoin, 18). Communal norms now help to regulate resource use, as well (Baudoin, 15-16). The marketing of honey is now facilitated by an association of producers formed through the program and local farmers' spaces and products have increased in diversity, in general (Baudoin, 11-12).

Ecuador

In Ecuador, where livestock had been damaging the forests and farmers cleared and burned forests to create fodder, (Fuentes, 8); the main goal of ECOBONA was to reduce poverty through forest and resource use (Fuentes, 1). This included providing alternative incomes through honey production, improved agriculture, raising livestock under controlled conditions, and improving direct market access to farmers (Fuentes, 4). The ECOBONA phase in Ecuador increased effort to institutionalize goals within local governments and rely less on the NGO (Fuentes, 10).

In Ecuador, a few farmers were receiving substantial assistance, at the time of the study (Fuentes, 7). About 1930 people benefitted from the program, with 47% being women (Fuentes, 8). Farmers now produce fodder outside the forests, livestock is kept in stables, and livestock productivity is higher (Fuentes, 8). Honey production used as virtual fences has increased incomes and prevented intrusion into the forest by outsiders (Fuentes, 8). Farmers have better food and can provide their children with more education with the whole family now getting involved in the production of coffee and cocoa (Fuentes, 9). The sustainable use of medicinal plants and sustainable firewood

collection, as well as the introduction of non-timber handicrafts has alleviated some pressure to cut timber (Fuentes, 9). Under the ECOBONA phase, there was improved local government leadership, democratic environmental management, and new land use plans and management plans (Fuentes, 10). However, the management plans had not yet been implemented at the time of the report (Fuentes, 13). The project has also strengthened communities' abilities to manage resources (Fuentes, 10).

Summary

Plans with community participation in planning, government implementation, and all three sustainable development elements with only content distribution differences are typically successful, as the following comparison, summarized in Table 5, demonstrates.

Table 5. Content Case Comparison

Case #7 – Sustainable Tourism in Costa Rica	Case #11 & Case #12 – ECOBONA in Bolivia & Ecuador
Government implementation	Government implementation
Community participation in planning and implementation before and during project	Community, NGO, and local government participation in planning and implementation during the project
Many goals in all three aspects through tourism development.	Goals of poverty reduction, socioeconomic development, and biodiversity. Focus on all three through agriculture and marketing.
Very beneficial in all three aspects	Beneficial in all three aspects

CHAPTER V

CONCLUSION

Public participation has become a key component of sustainable development programs. There are several arguments for why public participation is necessary to sustainable development. These arguments include (a) it is ethically correct to allow people control over their futures; (b) integrated decision-making by those affected assures appropriate programming as well as fostering agency and legitimacy; (c) participation increases legitimacy, which increases effectiveness of policies or programs; (d) agency combined with a formal stake leads to better self-enforcement. Yet, there are few studies attempting to verify the importance of participation in sustainable development programs. Furthermore, what and whom "public participation" includes varies widely.

The purpose of this research was to analyze sustainable development programs design, looking at participation, government role, and content through a comparative case study. The basic finding is that successful sustainable development programs typically include participation that is more meaningful by more segments of the public and program goals in all three areas of sustainable development. With this information, sustainable development programs can be designed more effectively, reducing investment risks and increasing actual benefits to communities.

Research Questions

The research questions investigated in this paper were: Is participation indicative of success in local sustainable development programs? Does the influence of participation depend on which segment(s) of the population participate, in what way, or at what stage in the program implementation? Are there other testable explanations for

success, i.e. government role, program content, or balance of sustainable development aspects within the goals?

Existing Literature

To analyze the success of sustainable development, it must first be defined as a measurable dependent variable. Then, the potential factors influencing success (i.e. participation, government role, and content) must be defined as independent variables.

Defining "Success" in Sustainable Development

Despite ambiguity and criticisms, sustainable development, based on the Brundtland definition of 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs,' (WCED); "has evolved a core set of guiding principles and values" (Kates et al., 2005, p. 20). It is an attempt to balance economic, environmental, and social needs of today without compromising those of the future. For the purposes of this paper, sustainable development is defined as economic development, social development, and/or environmental protection that is intended to not diminish economic, social, or environmental assets. Public participation, government role, and program content are three factors that may contribute to the success of sustainable development programs.

How to Measure Sustainable Development

The purpose of sustainable development indicators in this paper is to track program/policy success and to compare programs/policies. The literature indicates that it is desirable to have both a small number of indicators (Orians & Policansky, 2009, p. 396), and an inclusive indicator selection process (Kates, et al., 2005, p. 16). To incorporate both of these interests while acknowledging the limited quantitative data

available at a local level, status indicators were used to show economic, social, and environmental changes towards or away from sustainable development based on the indicators reported.

The most common frameworks used for sustainable development models are capital-based, Pressure-State-Response (PSR), Well-being, and Theme-based. Theme-based frameworks, indicator sets arranged into themes, are used here. The model divides indicators into the three themes of social development, economic development, and environmental protection. Status indicators in theme-based models display movement towards or away from goals with scores for each of the different themes. This paper then combines the three theme scores to rate overall sustainable development success.

Factors that May Affect the Success of Sustainable Development Programs

Public participation as a whole may influence sustainable development but subcategories within public participation may also be important. Some scholars define public participation as "stakeholder participation" (e.g. property owners, businesses, NGOs), while others require openness to all community members. Similarly, participation can include planning, implementation, and/or capacity building. Finally, participation also may happen at different times in the sustainable development project process. The role of the national government may increase sustainable development success according to Local Agenda 21 survey respondents. Here I considered government implementation, planning, and funding. Sustainable development typically considers economic development, social development, and environmental protection, but different programs have different areas of focus. There are many ways to balance the

three aspects of sustainable development. Content focus and amount are the final considerations in this paper.

Methodology

The first step was to identify the variables in measurable terms and rate the cases. Second, factors showing correlation with successful sustainable development were identified. Third, I compared pairs of case studies to trace causal linkages between the correlating factors and sustainable development success.

Identifying Measurable Variables

As mentioned above, a theme-based model was used to rate each theme of sustainable development separately and then totaled for the overall sustainable development success score (i.e. the dependent variable). Public participation was broken into subcategories and rated as 1 to 3, respectively, for each of the following: "population" participating (local government, NGOs/stakeholders, and community), "means" of participation (implementation, capacity building/training, and planning), and "timing" of participation (after, during, and before implementation). The Participation Total reflects the sum of these. The government role was rated 1 to 3 to distinguish implementation, planning, and funding. Content was scored for each aspect of sustainable development and totaled for overall number of goals (1 per goal). Content Mix, the number of sustainable development aspects addressed by the program goals, was scored with 1 for each aspect.

Correlation Testing and Analysis

Cases lacking enough information, focused on projects other than local sustainable development, or were too recent to show results were eliminated and the

sixteen remaining cases were charted to identify trends. Analysis was then performed through experimental graphical modeling. Bar graphs with each bar representing a grouped average were used to minimize small discrepancies in the rating system due to rater error.

Causal Linkages

Case studies were compared for causal linkages, as well as other explanations of the change. Logical analysis and counterfactuals were used to determine which factors in fact influenced sustainable development indicators for better or for worse. Pairs were selected in each major independent variable category to demonstrate or refute a theory of causality. Pairs were compared when they had as few variable differences as possible. Similarities and differences in programs were considered and alternative explanations for the demonstrated correlation were considered.

Findings

Programs with more segments of the population participating, participation by planning, government implementation, and all three sustainable development elements are typically successful.

Participation Is Linked to Success

More meaningful participation, earlier in the process, and with more of the community involved is correlated with more results that are successful. Total participation is consistently high across the most successful programs. The majority of low performing programs had low overall participation.

Timing of Participation Is Not Critical

It was anticipated that earlier involvement would have more successful results due to agency and ownership of the programs by the people affected. All four programs with early participation were successful. Other highly successful programs had participation only during implementation. However, the vast majority of cases allowed participation only during implementation. Thus, it does not seem critical for participation to occur early in the project process.

Meaningful Participation Correlates with Success

It was anticipated that a more meaningful role by participants would correlate with a more successful outcome and the results suggest the same. Where there is implementation by participants, it is clear that the additional ability to participate through capacity building and training or in planning may contribute to the success of the program. An increased average outcome was found from implementation only to implementation and capacity building, to implementation and planning.

The Sum of the Participant Segments Most Strongly Linked to Success

It was anticipated and found that participation by more people, and at lower levels of organizations, would correlate with higher outcomes. Community participation seems greater than only NGO or stakeholder participation but the sum of the participants is more demonstrative of success than any one component. All cases considered in this study had participation from some form of the "public" including NGOs, stakeholders (e.g. business owners), and/or community members.

When cases were compared where the government had planned the project, the more successful program had participation of community members in addition to

stakeholders, and capacity building where the less successful one had only stakeholder participation without capacity building. This further illustrates that more segments of the public participating in more meaningful ways increases the likelihood of program success. However, the more successful program also had social goals, which the less successful program did not. Social goals were also found to increase the likelihood of success, as the following section explains.

Government Role Is Not Predictive of Success

Government Planning Is Not Linked with Success

The two cases with positive results, where the government planned the projects, include an energy project in Cuba and an education program in Bolivia. The program in Bolivia had an exceedingly high public participation score with community members participating in the planning. The Cuba project may have had moderate success because of the highly centralized political system of Cuba and the fact that it involved an energy generation installation, which is a highly technical and specialized project.

When comparing two cases where stakeholders only implemented the program and economic goals were primary, the government planned project fared worse than no government involvement. Both programs had public participation in stakeholder implementation during the program. The primary difference was government involvement. However, the more successful program also had a social goal, where the other had an environmental goal and the more successful program was relatively simple, comparatively.

Government Implementation Is Inconclusive

Four of the five cases with government implementation also had community planning. Therefore, it is not clear that government assistance in implementation is as significant. It may be the community planning that made this subgroup so successful. This is further supported by the fact that the one negative case with government implementation was intended to have community input, but in practice, was planned by government agents instead.

Government Funding Is Inconclusive

Government funding was not instrumental in success. However, most nongovernment-funded programs were funded through alternate channels. Further research comparing government funded projects to projects with other funding sources is needed.

Certain Content Affects Success

Content was analyzed for its total number of goals, its primary focus (economic, environmental, or social), and for its mix of goals. This can be expressed as three questions: 1. Are better outcomes simply a function of a greater number of goals?; 2. Are economic, environmental, or social goals equally likely to succeed, and thus contributing to outcomes in proportionately?; 3. Are programs more successful when they have goals in each of the three aspects of sustainable development?

Number of Goals Is Not Determinative

Content Total did not correlate with Outcome Total.

Focus of Goals Linked to Outcome

A larger number of social goals are directly correlated with higher scores in social outcome, while environmental goals show a less pronounced correlation, and economic goals do not correlate with positive economic outcomes at all. However, social aspects of a program do not increase the success of a program disproportionately to economic aspects. Social goals are more strongly correlated with positive social effects than either economic or environmental goals are to their respective outcomes and social goals are correlated with more positive total outcomes, as well.

Content Mix of Goals May Affect Success

The three areas of sustainable development compliment one another. The most successful programs had a Content Mix of 3, while the least successful only included two elements in their goals. The cases with goals in only one aspect of sustainable development faired better on average than the cases with goals in two areas. However, the programs with goals in all three aspects performed more than twice as well on average than others. This indicates that the three aspects of sustainable development multiply the success of one another. However, the average participation also steadily increases as the Content Mix increases suggesting success may be attributed to participation rather than content.

Weaknesses and Suggestions for Further Research

This study undoubtedly contains some bias and uncertainty. While bias due to the imperfect process of creating quantitative grades from qualitative data was minimized through averaging the results, it is worth noting. It would be ideal to base grades on

numerical indicators as national and international studies have done. Unfortunately, these types of indicators are not yet widely tracked at a local level.

Another part of the weakness in grading was due to the use of case studies written by others. Ideally, a comparative case study uses cases observed with the same methodology; here both the methodology and disciplines of authors differed. There are differences in the way different fields frame the issues of sustainable development, and the biases of the authors are often evident due to their intense passion and interest in the subject. An attempt to keep in this in mind and frame the grading around strictly factual information was made but particularly in the case of social and environmental effects, some information had to be derived from the opinion of the authors or a report of the opinion of community members the authors interviewed.

In addition to authors from various disciplines writing case studies, employees of the NGOs who sponsored the projects wrote some case studies. Six cases were one of the same two programs (ECOBONA and FORSEFOR) in three different countries. In addition to those six cases, the INCOPA and AGRUCO cases were all taken from a single NGOs case study reports. Despite being funded by the same NGO, the four programs had significantly different independent variables and outcomes, amongst them. However, it is conceivable that these authors were more generous in their assessments than a third party would have been.

The last major weakness of this study is that it was simply not able to consider all of the potential influential factors for success in sustainable development, For example literacy as a signifier of community education levels would have been interesting to consider. Similarly, the nation's leniency toward environmental damage by corporations

is a potential influence on sustainable development. These and many other potential factors were beyond the scope of this project, and may not be realistic due to local data unavailability. However, in the future, it would be useful to have a comparative case study of factors such as those. It is hoped that the results of this and similar studies will be used to identify ways to change current international and national policies for more successful sustainable development programs.

APPENDIX

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