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Struggling with Sustainability—A Comparative Framework for Evaluating Sustainable Development Programs

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Summary. — "Sustainability" is an inherently dynamic, indefinite and contested concept. "Sustainable development" must, therefore, be seen as an unending process—defined not by fixed goals or the specific means of achieving them, but by an approach to creating change through continuous learning and adaptation. How, then, do we evaluate a development program's contribution to such a process? This paper constructs a framework for evaluating sustainable rural development programs using both process- and outcome-oriented criteria, and demonstrates its application. The SANREM CRSP/SEA research and development program in The Philippines—including ICRAFs efforts to organize communities around agroforestry and environmental conservation—is assessed.

Key words — sustainable rural development, program evaluation, participation, community organizing, Southeast Asia, Philippines

1. FUNDAMENTAL NATURE OF "SUSTAINABILITY"

As pervasive as the term may be in our discourse, "sustainability" is far from having a clear, distinct, or wholly accepted meaning in contemporary development circles (Preto, 1996). "Sustainability" is increasingly cited as an explicit goal of development efforts and remains a widely-touted global concern in spite of the fact that it is an inherently "complex and contested concept... [for which] precise and absolute definitions... are impossible" (Pretty, 1995, p. 1248). [1] This situation raises many questions which remain unanswered despite the popularity of the concept. One pressing question is how to evaluate programs that claim "sustainable development" as an explicit goal. In response, this paper reviews the commonly accepted core characteristics of sustainable development and uses them as the foundation for constructing a framework for the comparative evaluation of sustainable rural development programs. Finally, to demonstrate its application, the framework is used to evaluate a research and development program in the southern Philippines known as the Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program/Southeast Asia (SANREM CRSP/SEA). This US Agency for International Development-funded program was selected because its broad, comprehensive goals made it an ideal candidate for an evaluation of this kind.

As others have noted, the concept of sustainability is inherently difficult to pin down because its specific meaning and practical applications are: (a) *highly dynamic*—as a result of constantly seeking balance in the face of shifting background conditions (Angelsen, Fjeldstad, & Sumaila, 1994; Uphoff, Esman, & Krishna, 1998; World Bank, 2003); (b) *largely indefinite*—as a result of being based on necessarily abstract, context-specific, and very long-term goals (Flora, 2001; Harrington, 1995; van Pelt, 1993); and (c) *highly contested*—as a result of the many human values, perceptions and competing political interests evoked by the concept (Bell & Morse, 2003; Pretty, 1995). Of

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course, ''development'' is another normative idea open to considerable interpretation and debate on its own (Kaplan, 2000). Thus, the notion of ''sustainable development'' has become something of an intellectual quagmire of contested uncertainty. The intention of this article is to help move the debate forward by accepting the concept's inherent uncertainties and establishing some common ground nonetheless.

(a) *Process orientation*

A useful means of breaking through the intellectual gridlock surrounding the idea of sustainable development—and to approach a sensible means of evaluation—is to think of it as an unending *process* characterized by the approach used in guiding change rather than any fixed goal(s) to be achieved through specific technologies, policies, institutions or actions (Flora, 2001; Uphoff *et al.*, 1998). Most evaluation frameworks focus on assessing specific indicators of sustainability without investigating the nature of the processes responsible for such change (OECD, 2000; United Nations, 2001). A sustainable approach must be one based upon continuous learning and adaptation if the participants of development are to have any success in a world where conditions—e.g., environmental health, resource constraints, policies, technologies, markets, etc.—are in constant flux (Lightfoot *et al.*, 2001). Experience with many development projects that have not incorporated learning and adaptation but have, instead, focused on one-time improvements in policy, practices, infrastructure, technology, or public health has demonstrated that such progress can be easily eroded over time (Chambers, 1997; Esman & Herring, 2001; Fujisaka, 1989; Krishna, Uphoff, & Esman, 1997; Oakley, 1991; Stockmann, 1997). While these individual changes are vital to development, they alone are insufficient and hold no promise of sustainability.

Some argue that the most useful way to conceptualize sustainable development is as a process of social change that tackles underlying structural problems and is rooted in learning, continual innovation and ''perpetual novelty'' (Pretty, 1995, p. 1249). [2] Indeed, a process-oriented conceptualization may be the only way to adequately address the concerns raised above—i.e., that sustainability and development are fundamentally characterized by local variability, dynamic uncertainty and unpredictability (Mosse, 1998; Uphoff, 2002). Accepting this position, there is little choice but to treat sustainable development programs as flexible, iterative systems in which success is determined by the ability of both the program and the local community to innovate, learn, and adapt (Korten, 1980; Lightfoot *et al.*, 2001; Pretty, 1995, 2002). The obvious question for practitioners is: how do we help create a systemic process of learning and innovation that is focused on the values inherent to sustainability?

(b) *Participatory processes and community organizing*

It is widely held that broad-based community participation is a fundamental element of most effective sustainable development programs (Abaza & Baranzini, 2002; Oakley, 1991; Uphoff, 2002). Indeed, Reading and Soussan (1989) argued early on that ''the central tenet of sustainable development is that poor people should be given the opportunity to create their own solutions to the problems they face'' (p. 153). To achieve this, and to create a sustainable process of learning and innovation, local people and institutions must be treated not as mere collaborators, but as lead actors in the formal and informal research, trials and experimentation that can help orient them toward identifying and solving the problems they face (Defoer & Budelman, 2000; Mukherjee, 2002; Uphoff *et al.*, 1998).

While immediately influencing, educating, and empowering people is an important goal for a development program, the long-term perspective of sustainability demands that this process continue indefinitely, long after the program has ended. To achieve this, programs need to engage in community organizing to help build locally-controlled institutions which can eventually take over the roles of the program, and to create a sense of local investment in, control over and ownership of the development process to ensure that it is sustained (Deutsch, Busby, Orprecio, Bago-Labis, & Cequiña, 2001; Mercado, Garrity, Stark, & Patindol, 1998; Narayan, 1996). In this way a program can act as a catalyst for long-term social and structural change, including greater democratization and decentralization of authority (Chambers, 1994; Krishna & Bunch, 1997; Saugestad, 2001). [3]

If this is the vision of development derived from sustainability's core characteristics, then what sort of framework can be used to assess the relative success of a program designed to

promote sustainable development locally or to compare programs in different places? To spark further debate and research into this question, the author has assembled the following comparative framework based upon a survey of the existing literature. While its individual components are not entirely novel, as a whole it represents a uniquely comprehensive means of evaluating sustainable development programs.

2. A COMPARATIVE FRAMEWORK FOR EVALUATION

(a) *Process-oriented criteria*

While the specific context, goals and methods of any two programs will vary widely (and thus, so too will the criteria for evaluation), we can fundamentally compare any sustainable development programs based upon criteria that describe the type of approach taken. The nature of the approach is pivotal because it is the springboard for everything else we may choose to use in evaluating such programs. Of course, a program's approach will directly influence its specific impacts; but what is described in this section are the elements of a common ground that can be used to compare all sustainable development programs, no matter what they may be working on. The next section proposes a set of outcome-oriented criteria specifically designed to address the concerns of rural development projects. The six criteria summarized in Table 1, and explained in more detail below, are put forth as the most essential elements of an effective, sustainability-oriented approach to development programs.

(i) *Character of participation*

While the importance of community participation is widely recognized among development practitioners, a close examination of the many methods to which the term "participatory" is applied reveals considerable variability in meaning, degree and intent (Narayan, 1996). It is, therefore, possible to compare programs based upon the *character* of the participation involved, and to evaluate a program's potential for success based upon the appropriateness of that character.

What types of participation are generally best suited to sustainable development programs? While there are many appropriate participatory methods depending on the context, they all share some common principles. The critical concerns for successful and sustainable community involvement are: the respect and attention given to the opinions, ideas and perspectives of locals (Oakley, 1991; Prain, Fujisaka, & Warren, 1999; Pretty, 1995); the degree of control locals have in setting goals, making decisions, planning, implementing, and evaluating the program (Abaza & Baranzini, 2002; Lightfoot *et al.*, 2001; Uphoff *et al.*, 1998); and the extension to the community not only of information, but also the capacity to solve problems on their own through appropriate means of assessment, analysis, and experimentation (Defoer & Budelman, 2000; Humphries, Gonzales, Jimenez, & Sierra, 2000; Krishna *et al.*, 1997; Mukherjee, 2002).

(ii) *Success and nature of institution- and capacity-building efforts*

Whatever the particular aims of an individual development program, if changes (or the process of change) are to be sustained over time, then local people and their institutions will ultimately have to be responsible for making them last. Thus, sustainable development programs ought to invest significant resources in developing the local social capital necessary to maintain performance over the long-run (Pretty, 2002; Reij & Waters-Bayer, 2002). In practical terms, this means building and strengthening institutions—such as people's organizations, cooperatives, units of government, schools and universities, non-governmental organizations and research institutions—as well as the capacities of those institutions and individual actors to affect change—i.e., through basic

Table 1. *Process-oriented criteria for evaluating the approach of sustainable development programs*

1. Character of participation
2. Success and nature of institution- and capacity-building efforts
3. Diversity, multiplicity and adaptability of ideas promoted by the program
4. Accounting for heterogeneity, diversity and dynamism
5. Understanding and use of local knowledge, skills, initiative and constraints
6. Recognizing the influence of external conditions, markets and policies

education and extension, technology-transfer, networking and partnership-building, specialized training, and orienting people toward future learning, experimentation, adaptation and innovation (Chambers, 1997; Garrity, 1999; Neill & Lee, 1999). We can, therefore, partially evaluate a program's contribution to sustainable development on the basis of the success it has had in institution- and capacity-building.

(iii) *Diversity, multiplicity and adaptability of ideas promoted by the program*

Every development program promotes certain ideas—whether they are technologies, policies, or methods—designed to help achieve program goals. While the merits of any particular idea deserve careful scrutiny as a routine part of program evaluation (using outcome-oriented criteria such as those presented in the next section), there are some broader, process criteria that can be applied to the type of approach a sustainable development program takes in selecting the ideas it will promote. In the context of a program that combines research and development, these ideas tend to be the result of applied research tackling specific problems within the community. This is helpful because it tailors the solutions to the local context. No matter what the source of the ideas, though, to tackle adequately the full spectrum of challenges presented by sustainable development requires a great diversity and multitude of ideas that can be adapted locally (Lichtenberg, 2001; Mercado *et al.*, 1998; Prain *et al.*, 1999). This is necessary to meet the variable and evolving economic, ecological and social demands of sustainability. Indeed, there is no panacea for sustainable development and different people will require different solutions (Neill & Lee, 1999). Providing a full suite of options ensures that the program's recommendations are adoptable, adaptable and locally-appropriate, and that ecological health will be enhanced through the promotion of diversity in land use and species composition (Baumann, 2001; Posner & Gilbert, 1991; Poudel, 1998). [4]

(iv) *Accounting for heterogeneity, diversity and dynamism*

A program will be much more predisposed to interacting successfully with and influencing a community when it is designed around the fact that the target population, and the context it is embedded in, is diverse, heterogeneous, and changes over time (Cramb *et al.*, 2000; Esman & Herring, 2001; Hulme & Taylor, 2000). Unfortunately, history provides numerous examples of development programs that failed, in part, because of interventions based upon an assumption of relative homogeneity and stasis within the population, their livelihoods and the larger forces which shape their values and decision-making. Indeed, most funding schemes and government programs have, historically, been structured around a one-size-fits-all model of extension, technology transfer, and development (Chambers, 1994; Lopes & Flavell, 1998; Uphoff *et al.*, 1998). Yet, research by those attempting to model patterns of adoption clearly demonstrates that there is a great diversity of household circumstances to be found within local communities (Hall, 2004; Maumbe & Swinton, 2000; Nowak, Dhanakumar, & Zinnah, 1993). Furthermore, from a purely practical standpoint, it makes sense to orient programs toward heterogeneity within the community. To ignore the fact that different people have different interests and motivations is to pass up a valuable opportunity to increase the program's impact by appealing to the greatest possible number of people.

(v) *Understanding and use of local knowledge, skills, initiative and constraints*

No matter how large, well-funded, or well-staffed a sustainable development program may be, ultimately, it is the local people who are going to have to do most of the work and make most of the investments required to create change within their community. It is, therefore, vital that programs be designed to effectively tap into these latent human resources through a concerted effort to investigate—and then make use of—the knowledge, skills, initiative and constraints of the people it hopes to serve (Garrity, 1999; Mercado *et al.*, 2000; Reij & Waters-Bayer, 2002). To do so requires that a program invest considerable resources in investigating these things before and during a project, as local conditions, needs, skills, and knowledge are always evolving (Bezuneh, Ames, & Mabbs-Zeno, 1995; Koffa & Garrity, 2001). Such efforts will have a direct and powerful influence on program relevance, effectiveness, local acceptability, ability to take corrective action and, thus, overall success (Nelson & Cramb, 1998; Watson, 1995). To properly target their interventions, program staff need to not only understand how and why households make decisions, but they need to give primacy to local capabilities, needs, tra-

ditions, and ideas if they are to be accepted by the community (Humphries *et al.*, 2000; Posner & Gilbert, 1991).

(vi) *Recognizing the influence of external conditions, markets and policies*

Even when a program is intended to influence only one particular community, if it hopes to have a sustained impact, it cannot afford to ignore the broader context in which that community is embedded (Coxhead, Rola, & Kim, 2001a; Deininger, 2003). In designing interventions, it is unwise to assume that an individual or community is somehow isolated from markets, policies, or other external influences—economic, demographic, political, social, cultural, and environmental—which operate at national, regional, or even global scales (van Pelt, 1993). Thus, program staff need to be aware of these influences, investigate their strengths and design interventions with them in mind, even if the program has no control over them.

(b) *Outcome-oriented criteria*

While the six process-oriented criteria described above can help in evaluating the quality of a program's approach, it is also necessary to establish a framework to assess progress toward goals. [5]

Common ground may be more difficult to establish in this regard due to the wide variety of development projects, the diversity of their goals, and the varying nature of the contexts in which they operate. This paper, however, provides a framework for assessing the degree to which rural, Third World development programs have contributed to a process of sustainable development locally. The proposed framework has been constructed based upon a broad review of secondary literature and is summarized in Table 2.

The criteria listed in Table 2 are in no particular order and any attempt to rank them would be subjective and, ultimately, misleading. Each element can be thought of as an important thread in the tapestry of sustainable development—as more and more threads are woven together, the fabric grows stronger and the design more complete. While these criteria are all important components of sustainability, there is simply no logical means for ranking them and there is no alternative but to account for them all equally. Of course, no single project could be expected to properly address—much less achieve—all of the goals listed; yet, it is imperative that we consider this broader picture.

Together, the criteria in Table 2 describe an overall direction of change in a process of sustainable rural development. We can consider a sustainable rural development project to be "successful" if it helps create positive change without (intentionally or unintentionally) producing countervailing negative change within these realms. For instance, a project that reduces land degradation but at the same time increases poverty or inequality, or does so through the establishment of rigid institutions (e.g., forcing all farmers off a parcel of land and establishing a strictly exclusionary protected area), could not be considered successful in promoting sustainable development, no matter how great the improvement in environmental quality. On the other hand, a project which enhances environmental quality in a culturally-sensitive manner (e.g., through extension of appropriate conservation farming techniques) without having any effect on poverty or inequality (or any other factor, for that matter), could be considered somewhat successful in contributing to sustainable development even though it, alone, is grossly insufficient. Of course, the *most* successful projects are those which create significant positive change in many realms while generating little or no negative change. Thus, the *degree* of success can be estimated by assessing both the amount of positive change created and the number of elements addressed.

3. APPLYING THE FRAMEWORK—AN EXAMPLE

(a) *Case study*

Since 1993, the SANREM CRSP/SEA has acted as an umbrella program to sponsor and administer participatory research and development efforts focused on sustainability in the Manupali River watershed in the municipality of Lantapan, Bukidnon on the southern Philippine island of Mindanao. The program provided an ideal test-case for the framework above, as its unconventional commitment to adaptability, interdisciplinary collaboration, and "farmer-led identification of a research agenda" has oriented it toward "an exceptionally high degree of emphasis on process" (Coxhead & Buenavista, 2001, p. 5). [6] The emphasis on process, participation and community organizing is

Table 2. *Outcome-oriented criteria for evaluating sustainable rural development projects*

Economic

—Reduce inequality—improve intra- and intertemporal wealth, land and benefit distribution with regard to age, gender, ethnicity, geography, economic class, and social position;[a]
—Reduce poverty—quantitatively and qualitatively enhance income, employment, productivity, food security, and livelihood opportunities while reducing involuntary landlessness;[b]
—Increase security of land tenure—to encourage long-term investments in the health and productivity of land;[c]
—Increase access to credit—for the poor and small landholders, especially targeted to encourage long-term investments and conservation of natural resources;[d]
—Reduce dependency on external farm inputs—particularly expensive, inorganic, and non-indigenous inputs;[e]
—Diversify farm operations and livelihood strategies—to reduce risk and increase resilience;[f]
—Increase access to efficiently functioning markets and market information;[g]

Socio-political

—Cultural acceptability—of the project's goals and methods, as well as the changes, technologies and policies promoted;[h]
—Policy support—promote policies favorable to project's goals or tailor interventions to work within existing policy structure;[i]
—Facilitate learning and knowledge-sharing—to empower individuals and communities, e.g., through extension, farmer-to-farmer exchanges, participatory experimentation, school programs, technical assistance, etc.;[j]
—Institutional flexibility/adaptability—to ensure resilience and continued relevance both within the program itself and among the organizations it helps create or strengthen;[k]
—Facilitate a process of social change—to improve attitudes, values, awareness, and behaviors as they relate to the goals of sustainable development;[l]
—Minimize local growth in human population and consumption of non-renewable resources;[m]
—Organize communities and mobilize local resources—material, human, financial, institutional, political, and cultural—toward the achievement of project objectives;[n]

Ecological

—Maintain ecological integrity—by promoting the stability and healthy function of balanced and biodiverse (agro-)ecosystems;[o]
—Protect and/or increase biological and genetic diversity (particularly of indigenous species)—both on- and off-farm to improve nutrient cycling, soil conditions, productivity, and food security, while minimizing pests and risk overall;[p]
—Prevent land degradation—preserve soil health and fertility, e.g., through fallowing, crop rotation, careful management of organic matter, planting of nitrogen-fixing species, and through means to minimize erosion, nutrient loss, and soil acidification or pollution;[q]
—Protect air and water quality—prevent both point source and nonpoint source pollution, e.g., by minimizing erosion, nutrient runoff, and the application of inorganic agrochemicals;[r]

[a] See Angelsen *et al.* (1994), Brown (2000), George (2000), Harrington (1995), Herr (1981), Moncada *et al.* (1998), and van Pelt (1993).
[b] See Angelsen *et al.* (1994), Barrett *et al.* (2000), Brown (2000), Deininger (2003), Garrity *et al.* (2001, 2003), Harrington (1995), Hopkins *et al.* (1999), Minten and Zeller (2000), Moncada *et al.* (1998), Rola and Coxhead (2001), Uphoff (2002), van Pelt (1993), Watson (1995), Yunus and Jolis (2003) and Zeller and Meyer (2002).
[c] See Carter and Barham (1996), Carter and Olinto (2003), Coxhead and Buenavista (2001), Coxhead *et al.* (2001a), Deininger (2003), Garrity (1999), Garrity *et al.* (2001, 2003), Lerman *et al.* (2002), Mäler and Vincent (2003), Neill and Lee (1999), Nelson and Cramb (1998) and Rola and Coxhead (2001).
[d] See Boucher *et al.* (2003), Carter and Olinto (2003), Deininger (2003), Nelson and Cramb (1998), Rahman (2001), Yunus and Jolis (2003) and Zeller and Meyer (2002).
[e] See Baumann (2001), Bezuneh *et al.* (1995), Dufour (2000), Maumbe and Swinton (2000), Prain *et al.* (1999), Reij and Waters-Bayer (2002) and Watson (1995).
[f] See Geran (2001), Minten and Zeller (2000), Neill and Lee (1999), Poudel *et al.* (1998) and Uphoff *et al.* (1998).
[g] See Angelsen *et al.* (1994); Boucher *et al.* (2003), Coxhead *et al.* (2001a); Mäler and Vincent (2003), Minten and Zeller (2000) and Zeller and Meyer (2002).
[h] See Esman and Herring (2001), Humphries *et al.* (2000), Kaplan (2000), Posner and Gilbert (1991), Prain *et al.* (1999), Pretty (2002), Reij and Waters-Bayer (2002) and Saugestad (2001).
[i] See Angelsen *et al.* (1994), Coxhead *et al.* (2001a), Deininger (2003), Esman and Herring (2001), Harrington (1995),

Table 2—*continued*

Hopkins *et al.* (1999), Kirkpatrick *et al.* (2002), Lee and Kirkpatrick (2000), Pretty (1995) and Pretty and Frank (2000).
[j] See Defoer and Budelman (2000), Garrity (1999), Humphries *et al.* (2000), Maumbe and Swinton (2000), Neill and Lee (1999), Prain *et al.* (1999) and Reij and Waters-Bayer (2002).
[k] See Brinkerhoff and Goldsmith (1992), Krishna *et al.* (1997), Lightfoot *et al.* (2001), Lopes and Flavell (1998), Pretty (1995), Pretty and Frank (2000), and Wijayaratna (2002).
[l] See Brinkerhoff and Goldsmith (1992), Buenavista *et al.* (2001), Cramb *et al.* (2000), Garrity (1999), Garrity and Mercado (1998), Hulme and Taylor (2000); Humphries *et al.* (2000), Kaplan (2000), Lee and Kirkpatrick (2000), Lichtenberg (2001), Mosse (1998), Parthasarathy and Iyengar (1998); Pretty (2002); Uphoff (2002) and van Pelt (1993).
[m] See Angelsen *et al.* (1994), Garrity (1999), Harrington (1995) and Kaplan (2000).
[n] See Garrity *et al.* (2003), Garrity and Mercado (1998), Geran (2001), Humphries *et al.* (2000), Lopes and Flavell (1998), Mosse (1998) and Pretty and Frank (2000).
[o] See Common (2000), Dufour (2000), Flora (2001), Garrity (1999), Harrington (1995), Humphries *et al.* (2000) and Uphoff (2002).
[p] See Baumann (2001), Dufour (2000), Garrity (1999), Garrity *et al.* (2003), Harrington (1995), Koffa and Garrity (2001), Neill and Lee (1999), Posner and Gilbert (1991), Prain *et al.* (1999) and Reading and Soussan (1989).
[q] See Baumann (2001), Bezuneh *et al.* (1995), Defoer and Budelman (2000), Hinchcliffe *et al.* (1995), Hopkins *et al.* (1999), Humphries *et al.* (2000), Poudel (1998) and Watson (1995).
[r] See Dufour (2000), Hinchcliffe *et al.* (1995), Hopkins *et al.* (1999) and Poudel (1998).

particularly reflected in the projects run by one SANREM CRSP/SEA collaborator known as the International Centre for Research in Agroforestry (ICRAF).

As an example of the insights to be gained by such an analysis, the above framework was employed in an independent evaluation of an experimental ICRAF project designed to organize community groups around agroforestry and the protection of natural resources for the purpose of promoting sustainable development in Lantapan. ICRAFs efforts led to the organization of an entrepreneurial group known as the Agroforestry Tree Seed Association of Lantapan (ATSAL) in 1997 and, a year later, to the formation of dozens of village- and neighborhood-level "Landcare" groups devoted to the conservation of natural resources and local development throughout the watershed (ICRAF, 2001a; Mercado *et al.*, 1998; Mercado *et al.*, 2000).

(b) *Methods*

The project was assessed by the author—a wholly independent researcher with no ties to the program in question, using funds provided through a Fulbright fellowship. The study was conducted over an eight-month period in 2001 using an interdisciplinary approach that combined qualitative and quantitative methods, including:

—Direct- and participatory-observation [7]—of staff activities in the field, trainings, farmer-to-farmer exchanges, field trips, research programs, meetings, seminars, conferences, farming practices, and local farm, landscape and socioeconomic conditions.

—Open-ended interviews [8]—with 15 key informants (including local leaders, decisionmakers, and those implementing the program) and 91 general respondents (including all ATSAL members and at least one member from each Landcare group in Lantapan).

—Sample surveys [9]—including both a panel survey of 84 respondents—comparing a completely-random sample of Lantapan residents surveyed by the SANREM CRSP/SEA in 1998, [10] and again by the author in 2001; as well as a new, entirely independent sample of 101 respondents stratified by *purok*—i.e., one respondent randomly selected from each subvillage. The surveys allowed for a quantitative assessment of changes across time as well as differences across "distance"—including one's geographic remoteness, social isolation, and closeness-to-project. As most of the data used for comparison was not continuous but binomial (e.g., "correct/incorrect" or "yes/no")—or, in some cases, categorical—standard assumptions of statistical normality were inappropriate, and in these cases, a logit analysis was used. [11]

The central question at the heart of the assessment was: *How has the organizing of ATSAL and Landcare contributed to a process of sustainable development in Lantapan*?

(c) *Findings*

Lacking a baseline of survey data prior to implementation of SANREM, one means of

measuring the impact of the program was to group survey respondents based on their closeness to the various projects (e.g., those who know of SANREM, ICRAF and/or Landcare *versus* those who do not) and then compare the awareness, attitudes, practices and demographics of these subgroups. The results of this analysis are summarized in Tables 3–6. While the findings presented in Table 3 suggest that the programs have not had a population-wide influence on the conservation practices of Lantapan farmers, Tables 4 and 5 present data suggesting that they *are* having a significant, positive influence on the environmental awareness and attitudes of those close to the projects.

It should be noted that, at the time of the 2001 survey, both ATSAL and Landcare were fairly recent phenomena—only two or three years old—making it likely that many of the effects of these projects would be too localized to be observed in a population-wide survey. Indeed, though useful in evaluating the overall impacts of SANREM and ICRAF, the survey proved to be too blunt an instrument for understanding the specific impacts of the ATSAL and Landcare projects, for which interview and observational data provided more meaningful insight. After speaking with project staff and participants and observing ICRAFs community organizing work, it became clear that the projects are, indeed, influencing specific households and communities and that they have tremendous potential for influencing the overall process of development. As explained below, the projects are making a contribution of notable quality to a development process in Lantapan that has many of the characteristics of sustainability outlined in Table 2. As will be argued in further detail later, what is primarily responsible for the program's numerous successful outcomes is careful attention to the types of process elements listed in Table 1.

(i) *Economic impacts*

—*Reduce inequality*—The program does not directly promote a redistribution of wealth or land—e.g., ICRAF does not specifically target only the very poorest or the landless. It does, however, seem to be making a contribution through a participatory, egalitarian approach in which access is afforded and benefits are distributed without regard to geographic remoteness or location, wealth, land tenure, farm size, gender, or age (see Table 6). In interviews, there was broad consensus that the program does, indeed, benefit marginalized people; and, over time, we can expect this to gradually help level the playing field by providing important new opportunities for those most in need.

—*Reduce poverty*—The panel survey data in Table 7 indicate that, over the life of the project, a process of "development" has occurred in Lantapan in the most basic sense of things such as improved wealth, land tenure and living conditions, increased access to irrigation, and a general move away from strict reliance on agriculture. We cannot explicitly document causation in this case, but the weight of evidence suggests that the projects have played at least *some* positive role in this process. Seventy-seven percent of Landcare interviewees and all ATSAL members believe that groups like their own are economically important for Lantapan. Productivity and food security would be enhanced by the conservation practices being promoted; and livelihood opportunities are particularly increased by groups like ATSAL that focus on tapping into new markets.

—*Increase security of land tenure*—Though the program makes no direct efforts in this regard, the survey data in Table 6 show that those who know of the projects tend to have a greater diversity of land tenure arrangements, while those who do not know tend to own the land they farm. In other words, the program is at least not contributing to the problem by primarily benefiting landowners at the expense of others. The program helps reduce landlessness only indirectly by promoting conservation measures that can help avoid land exhaustion and abandonment.

—*Increase access to credit*—Sadly, the program has yet to make any effort to improve access to credit. Not only could such a move help encourage long-term investments in environmental health, but it would mean responding to a very real need felt amongst project participants: when asked what form of assistance they would most prefer, 20% of Landcare members and 38% of ATSAL members cited loans, even though outright grants was an option.

—*Reduce dependency on external farm inputs*—The author found that the projects are generally helping Lantapan farmers learn how to make optimal use of locally-available

Table 3. *Closeness-to-projects has no observable influence on conservation practices*

Practices (1 = currently implementing; 0 = abandoned or never implemented)	Know of SANREM?		Know of ICRAF?		Know of Landcare?		Comprehensive knowledge of programs index[a]
	Yes	No	Yes	No	Yes	No	
Contour plowing on slopes	0.7	0.5	0.8	0.6	0.9	0.6	0.5, 0.6, 0.6, 1.0, 1.0, n.a., 1.0
	(0.240)[b]		(0.437)		(0.184)		(0.212)
Contour strips or hedgerows	0.4	0.7	0.3	0.5	0.4	0.5	1.0, 0.3, 0.2, 0.3, 1.0
	(0.135)		(0.413)		(0.758)		(0.207)
Regular fallowing	0.6	0.5	0.7	0.5	0.5	0.5	0.5, 0.5, 0.5, 0.8, 0.5, 0.7
	(0.709)		(0.212)		(0.613)		(0.747)
Regular crop rotation	0.5	0.3	0.6	0.4	0.5	0.4	0.3, 0.4, 0.3, 0.8, 1.0, 0.7
	(0.366)		(0.194)		(0.636)		(0.109)
Planting trees on farm	0.8	0.8	0.8	0.8	0.9	0.7	0.7, 0.8, 0.8, 1.0, 1.0, 0.7, 1.0
	(0.693)		(0.651)		(0.096)		(0.272)
Cumulative practices score[c]	0.1	0.03	0.4	−0.03	0.2	0.1	−0.1, −0.04, −0.1, 0.8, 0.8, 0.3, 0.0
	(0.708)		(0.185)		(0.750)		(0.195)

Source: 2001 independent sample stratified by sub-village. $n = 101$.

[a] Summary indicator of relative closeness to all of the projects based on whether respondents know of SANREM, ICRAF, Landcare and ATSAL, and whether they know what the main goals of each are. Means in this row correspond to subsamples divided on the basis of the respondent's categorical index value (i.e., the first mean is for the subsample having an Index value of one, the second mean is for the subsample having an Index value of two, and so on).

[b] Values in parentheses are *p*-values calculated by means of binary or ordinal logistic regression.

[c] Summary indicator of respondents' overall conservation practices, scored as follows: one point awarded for each conservation practice currently implemented, no points awarded for each practice which is not applicable or abandoned, and one point subtracted for each practice never adopted.

Table 4. *Influence of closeness-to-projects on environmental awareness*

Awareness (1 = correct response; 0 = other)	Know of SANREM?		Know of ICRAF?		Know of Landcare?		Comprehensive knowledge of programs index
	Yes	No	Yes	No	Yes	No	
Contour farming reduces erosion	0.7	0.4 (0.004)[a]	0.8	0.4 (<0.001)	0.8	0.5 (0.008)	0.2, 0.4, 0.8, 0.6, 0.9, 1.0, 1.0, 1.0 (<0.001)
Growing annual crops is more erosive than planting trees and perennials	0.8	0.6 (0.023)	0.9	0.7 (0.014)	0.9	0.7 (0.017)	0.5, 0.8, 0.9, 0.8, 1.0, 1.0, 1.0, 1.0 (<0.001)
Upland erosion has negative impacts on lowland populations	0.7	0.5 (0.160)	0.7	0.6 (0.202)	0.8	0.5 (0.048)	0.4, 0.6, 0.6, 0.6, 0.8, 0.8, 1.0, 1.0 (0.009)
Excessive agrochemical use threatens water quality	0.5	0.4 (0.443)	0.6	0.4 (0.147)	0.6	0.4 (0.097)	0.3, 0.5, 0.4, 0.5, 0.8, 0.5, 0.7, 1.0 (0.013)
Deforestation degrades natural resources such as soil and water	0.8	0.6 (0.023)	0.9	0.7 (0.092)	0.8	0.7 (0.549)	0.6, 0.8, 0.8, 0.8, 1.0, 0.8, 1.0, 1.0 (0.012)
Upland agricultural expansion causes deforestation	0.9	0.7 (0.032)	0.9	0.7 (0.094)	0.9	0.8 (0.277)	0.6, 0.9, 0.8, 0.9, 0.9, 0.8, 1.0, 1.0 (0.006)
Planting trees provides income and/or useful materials	0.9	0.9 (0.648)	1.0	0.9 (0.372)	1.0	0.9 (0.397)	0.9, 0.9, 1.0, 1.0, 1.0, 0.8, 1.0, 1.0 (0.461)
Cumulative awareness score[b]	4.3	3.2 (0.002)	4.8	3.5 (0.001)	4.7	3.6 (0.004)	2.6, 4.0, 4.4, 4.1, 5.3, 4.8, 5.7, 6.0 (<0.001)

Source: 2001 independent sample stratified by sub-village. $n = 101$.

[a] Values in parentheses are *p*-values calculated by means of binary or ordinal logistic regression.

[b] Summary indicator of respondents' overall awareness, scored as follows: one point awarded for each response indicating awareness of the issue and no points awarded for any other response.

Table 5. *Influence of closeness-to-projects on attitudes toward environmental protection*

Attitudes (1 = strongly disagree to 9 = strongly agree)	Know of SANREM?		Know of ICRAF?		Know of Landcare?		Comprehensive knowledge of programs index
	Yes	No	Yes	No	Yes	No	
"It is very important to take steps to *prevent soil erosion on sloping lands*, even if this means lower incomes for some farmers."	7.9	7.2 (0.067)[a]	7.4	7.8 (0.372)	7.6	7.7 (0.750)	7.3, 8.0, 7.9, 7.5, 8.0, 6.0, 7.7, 9.0 (0.634)
"It is very important to take steps to *protect forests*, even if this means lower incomes for some farmers."	8.3	7.8 (0.102)	8.5	7.9 (0.092)	8.4	8.0 (0.284)	7.6, 8.1, 8.3, 8.5, 8.6, 8.3, 9.0, 9.0 (0.035)
"It is very important to *preserve the quality of water* in rivers and streams, even if the community must pay to accomplish this."	8.5	8.0 (0.055)	8.7	8.2 (0.124)	8.5	8.3 (0.528)	8.0, 8.5, 8.3, 8.8, 8.6, 9.0, 9.0, 9.0 (0.048)
"The *planting of trees on farms* has a very important role to play in simultaneously increasing incomes and improving environmental quality."	8.4	8.0 (0.143)	8.4	8.2 (0.475)	8.5	8.2 (0.277)	8.0, 8.4, 8.3, 7.6, 8.8, 9.0, 9.0, 9.0 (0.158)
Cumulative attitude score[b]	7.1	6.8 (0.350)	6.9	7.1 (0.590)	6.8	7.1 (0.415)	6.8, 7.5, 6.9, 6.8, 6.6, 7.3, 7.7, 5.3 (0.935)

Source: 2001 independent sample stratified by sub-village. $n = 101$.

[a] Values in parentheses are p-values calculated by means of binary or ordinal logistic regression.

[b] Average of all attitude responses.

Table 6. *Evidence of a relatively non-discriminatory approach*

	Know of SANREM?		Know of ICRAF?		Know of Landcare?		Comprehensive knowledge of programs index
	Yes	No	Yes	No	Yes	No	
Total geographic distance[a]	66.2	105.8 (0.070)[b]	77.4	82.1 (0.833)	85.4	78.8 (0.770)	115, 61, 54, 78, 126, 39, 49, 30 (0.158)
Household location (1 = upland, 0 = lowland)	0.6	0.5 (0.349)	0.7	0.5 (0.100)	0.6	0.6 (0.550)	0.5, 0.5, 0.5, 0.6, 0.8, 1.0, 0.7 (0.194)
Wealth index[c]	6.5	6.2 (0.329)	6.6	6.3 (0.476)	6.3	6.5 (0.619)	6.1, 6.4, 6.6, 6.4, 6.4, 7.4, 6.2, 7.5 (0.287)
Land tenure[d]	2.4	1.4 (0.033)	3.4	1.6 (0.001)	2.4	1.8 (0.225)	1.2, 1.9, 2.1, 2.1, 3.0, 5.0, 3.0 (0.001)
Farm size (hectares)	1.6	0.9 (0.375)	1.6	1.2 (0.653)	1.0	1.4 (0.616)	0.8, 1.6, 2.4, 1.3, 0.2, 1.4, 1.2, 0.0 (0.828)
Gender (1 = male, 0 = female)	0.6	0.6 (0.903)	0.6	0.6 (0.852)	0.6	0.6 (0.417)	0.7, 0.5, 0.7 0.8, 0.4, 0.5, 0.7, 1.0 (0.961)
Age	41.4	43.9 (0.352)	41.1	42.8 (0.542)	38.2	44.0 (0.045)	45, 45, 40, 35, 39, 34, 43, 58 (0.061)

Source: 2001 independent sample stratified by sub-village. $n = 101$.

[a] Indicator of respondents' relative geographic remoteness, calculated as the sum of the distance (in minutes of walking time) from the respondent's home to the national road and to their village meeting hall.

[b] Values in parentheses are *p*-values calculated by means of binary or ordinal logistic regression.

[c] A measure of the relative wealth of the respondent by proxy, scored as follows: one point if household has electricity, plus a score for house construction materials (i.e., bamboo = 1, bamboo and wood = 1.5, wood = 2, wood and concrete = 2.5, concrete = 3), plus a score for roofing materials (i.e., grass = 1, grass and bamboo = 1.5, bamboo = 2, bamboo and metal = 2.5, metal = 3), plus a score for the most expensive item owned (i.e., radio = 1, television = 2, motorcycle = 3, truck = 4).

[d] As averages, the numerical values in this row are fairly meaningless, as they correspond only to categorical codes. However, statistically significant *p*-values imply no relationship between any particular type of tenure and closeness-to-project.

Table 7. *Indications of a process of development occurring over time*[a]

	1998 Sample without dropouts (%)	2001 Sample (%)
% For whom farming is primary income source	90	45***
% Using irrigation	14	55***
% Owning their most important farm plot	36	79**
Proxy wealth measures		
% Having electricity	70	69
% Living in bamboo house	56	7***
% Living in house with metal roof	95	100*
% Owning radio	87	86
% Owning television	40	52
% Owning motorcycle	10	10

Source: Panel surveys of the same respondents in 1998 and 2001. $n = 84$.

[a] *p*-Values calculated by means of binary logistic regression.

* Denotes statistically significant difference at $p < 0.05$.

** Denotes statistically significant difference at $p < 0.01$.

*** Denotes statistically significant difference at $p < 0.001$.

resources and how to maintain productivity without the use of expensive, inorganic inputs. This is done by a variety of means, including extension of tree seed collection and nursery management techniques, composting and organic farming methods, integrated pest management practices, polycultural cropping systems, indigenous tree species husbandry, and soil conservation strategies to maintain fertility.

—*Diversify farm operations and livelihood strategies*—The panel survey data in Table 7 suggest that, since the projects began, Lantapan has seen a significant shift away from strict reliance on farming as a primary source of household income. Landcare and ATSAL are both helping farmers investigate ways to reduce risk and increase resilience through highly diversified, polycultural cropping and agroforestry systems, as well as a variety of other rural livelihood options ranging from livestock to forest products to mushrooms to aviculture to handicrafts.

—*Increase access to efficiently functioning markets and market information*—Unfortunately, this has only been a minor aspect of ICRAFs Landcare facilitation. On the other hand, helping farmers understand and access external forest-product markets has been a central component of ICRAFs work with ATSAL (Baltazar, 2001).

(ii) *Socio-political impacts*

—*Cultural acceptability*—Obviously, this is a difficult factor to measure or make generalizations about, but it is something ICRAF is clearly sensitive to. The fact that ICRAFs Lantapan staff is made up entirely of Filipinos—most of whom are native to Mindanao—and that the projects themselves are highly participatory and farmer-driven helps ensure cultural acceptability. Furthermore, when asked if groups like their own are important for the future of Lantapan, 95% of ATSAL and Landcare members agreed that they are.

—*Policy support*—This is an emerging concern within ICRAF, and there are some successes to note in this regard. ICRAF sees local government support as one of the three main pillars upon which Landcare is built and sustained (Garrity & Mercado, 1998; ICRAF, 2001a, 2001d). In Lantapan, Landcare is mainly being supported through the municipal Natural Resource Management and Development Plan. ICRAF cites "enthusiastic" local government involvement, funding, policy support, and technical assistance for Landcare in the region (Garrity & Sumbalan, 2000; Mercado *et al.*, 2000). Considerably greater effort needs to be invested in affecting the national-level policy landscape, however.

—*Facilitate learning and knowledge-sharing*—All evidence suggests that the projects are helping perpetuate learning, knowledge-sharing and innovation through a wide variety of means including extension and community organizing, farmer-to-farmer exchanges, participatory experimentation and field trials, school programs, technical assistance, and farmers' field schools.

—*Institutional flexibility/adaptability*—Due to a fundamentally experimental approach and reliance on adaptive management, the SANREM CRSP/SEA, ICRAF, Landcare and ATSAL all show a high degree of institutional flexibility and adaptability. [12] Resilience and continued relevance are ensured by the flexibility to be found at this confluence of research and development work.

—*Facilitate a process of social change*—As documented in Tables 4 and 5, the program appears to be having a significant, positive influence on environmental awareness and attitudes. As Mercado *et al.* (2000) explain, "the greatest success of Landcare is changing the attitudes of farmers, policymakers, local government units, and landowners about how to use the land and protect the environment" (p. 13). In describing the Lantapan Landcare experience, Garrity *et al.* (2003) argue that "environmental awareness has increased substantively during the past three years... [and] a conservation ethic is evolving and biodiversity protection is coming to be viewed as a local responsibility, pursued with pride" (p. 8).

—*Minimize local growth in human population and the consumption of non-renewable resources*—It is hard to see how the program is making any significant contribution in this regard, other than generally contributing to a process of development which may ultimately reduce the vulnerability of households and decrease the associated incentives for having large families. At the same time, however, such local development might provide significant incentives for in-migration. The population of Lantapan

continues to grow at rates of roughly 4% (Catacutan, Mercado, & Patindol, 2000). On the positive side, the consumption of nonrenewables may be somewhat reduced through the adoption of the types of farming systems promoted by the program which are less reliant on inorganic chemical inputs.

—*Organize communities and mobilize local resources*—ICRAF has done an impressive job of organizing communities around environmental protection, conservation farming, and agroforestry. In the span of just two years, ICRAF helped organize over 60 Landcare groups in Lantapan and over 250 groups in northern Mindanao, involving over 3,000 households (Catacutan *et al.*, 2000; ICRAF, 2001d). In the process, ICRAF has been able to mobilize tremendous material, human, financial, institutional, political, and cultural resources from local communities and governments toward the achievement of program objectives.

(iii) *Ecological impacts*

—*Maintain ecological integrity*—ICRAF is not only working to protect the ecological integrity of Lantapan's forested uplands and the neighboring Mt. Kitanglad Range Nature Park, but it continues to expand its efforts in the lowlands, as well. In all cases, the program is designed to promote the stability and healthy function of balanced and diverse (agro-)ecosystems which preserve vital natural resources. As evidence of this effort, Lantapan's Landcare members have planted nearly 85,000 timber and fruit trees, and over 500 farmers have adopted some form of contour/hedgerow conservation farming (ICRAF, 2001d).

—*Protect and/or increase biological and genetic diversity (particularly of indigenous species)*—Landcare and ATSAL both promote highly diversified, polycultural cropping and agroforestry systems, as well as environmental restoration projects, with the intent of improving both on- and off-farm nutrient cycling, soil conditions, productivity, and food security, while minimizing pest damage and overall risk. Unfortunately, ICRAF is also promoting several exotic tree species, such as *Eucalyptus deglupta*, which have positive economic attributes but, if too successful, may ultimately threaten local biodiversity and ecosystem function.

—*Prevent land degradation*—Though Table 3 suggests that, population-wide, those closer to the program are no more likely to adopt conservation farming practices than others, interviews with Lantapan farmers and observations of their practices revealed that the program has helped numerous individual farmers preserve soil health and fertility. Program staff were observed exposing farmers to conservation methods such as fallowing, crop rotation, management of organic matter, planting of nitrogen-fixing species, and various means of minimizing erosion, nutrient loss, and soil acidification or pollution. Of course, not all exposures lead to adoption, but there is evidence that the projects are, indeed, influential. For instance, interviews revealed that roughly 95% of Landcare and ATSAL members with sloping farms use some form of conservation measures; and 97% of Landcare members and all ATSAL members report that membership in the group encourages on-farm experimentation with such methods.

—*Protect air and water quality*—In the same manner, the program is contributing to a reduction of non-point source pollution on specific farms by promoting conservation farming practices which minimize erosion, nutrient runoff, and the application of inorganic agrochemicals.

SANREM CRSP/SEA researchers have conducted extensive field studies in Lantapan to investigate the ecological impacts of adopting the types of conservation practices promoted by the program. There is insufficient space here to review all of these impacts, but they are summarized by Midmore, Nissen, and Poudel (2001).

(iv) *Reasons for success*

In sum, though there is considerable room for improvement in certain areas, the weight of evidence suggests that this is a successful sustainable development program, insofar as it is having a positive or, at least, neutral influence on all the outcome criteria from Table 2. What accounts for such success on so many fronts? Undoubtedly, the most important factor—and, indeed, the most admirable aspect of the Landcare and ATSAL projects—has been the quality of the approach used by the program. As detailed below, the evidence suggests that the program and its projects are all firmly rooted in an approach that can be evaluated very positively in light of the process-oriented criteria from Table 1.

Character of participation: Broad-based, non-discriminatory community participation and grassroots mobilization is at the very core of the projects (ICRAF, 2001d; Koffa & Garrity, 2001; Mercado *et al.*, 2000). The survey results document SANREM and ICRAFs egalitarian approach, providing access to all types of people (see Table 6). In facilitating Landcare, program staff were observed to be regularly engaging the community through mutually respectful dialogue and action. The concerns and ideas of local people were listened to and, especially in the years leading up to ATSALs formation, they were actively researched (Garrity *et al.*, 2003).

There has also been a tremendous emphasis on community organizing and capacity-building to help give local people the opportunity to identify and find solutions to their own problems (ICRAF, 2001d). While ICRAF provides guidance and facilitation, the self-governing community groups are free to set their own agendas and locals are intimately involved in the decisionmaking, planning and action that takes place within their communities (Garrity *et al.*, 2003; ICRAF, 2001b; Mercado *et al.*, 2000). Indeed, the ATSAL and Landcare projects represent a very advanced form of participation, involving elements of what Pretty (1995) defines as ''interactive participation'' and ''self-mobilization.'' This is highly encouraging from the perspective of sustainability because it implies that local people will ultimately feel they have a strong stake in the success of the project, increasing the likelihood that they will invest the time, energy, thought and material resources necessary to sustain the efforts over the long-run (Krishna *et al.*, 1997; Prain *et al.*, 1999). Indeed, the author observed numerous examples of local people committing personal or communal resources to the program. Landcare members, for example, volunteered the labor, materials and tools necessary to construct and maintain over 60 neighborhood tree nurseries and a central office for the Lantapan Landcare Association. Local government units also got involved by devoting significant portions of their budget to support the Landcare program.

Success and nature of institution- and capacity-building efforts: Landcare and ATSAL are flagship projects of the SANREM CRSP's overall efforts to build local institutions and bolster the capacity of local people to manage their own natural resources effectively. These types of efforts, particularly in the areas of water quality monitoring, agroforestry, and natural resource management planning, have been a primary focus for SANREM CRSP/SEA in recent years (Buenavista & Coxhead, 2001). One key element of the program's approach is to transmit the findings of its research to the people of Lantapan. In fact, all ATSAL members and 75% of Landcare interviewees reported that ICRAF and the SANREM CRSP/SEA do, indeed, share the results of their research. The ASTAL and Landcare projects engage in many forms of capacity-building, including: technical, managerial and leadership trainings, seminars and workshops; formal and informal on-farm experimentation, field trials and field demonstrations; field trips to working farms and experimental research plots; slide shows; facilitated group meetings and discussions; farmers' field schools; individual extension; and even a popular radio show airing three times a week (Garrity, 1999; Mercado *et al.*, 1998, 2000).

ICRAF is also engaged in institution-building via the strengthening of existing natural resource management institutions—e.g., municipal and provincial governments—and the formation of local people's organizations through which residents share ideas, information and inspiration while connecting with external resources and ICRAF facilitators who help them understand how to learn about sustainability, adapt and innovate. In numerous settings, the author observed that local people were inspired by the program to debate issues of natural resource management and sustainability within the community, experiment with new ideas on their farms, and exchange information with neighbors. It appears that this is leading to the widespread institutionalization of an on-going process of learning and innovation within the community. There is also evidence that both the Landcare and ATSAL approaches are effective in promoting on-farm experimentation and informal farmer-to-farmer exchanges (Mog, 2003). [13] Much more preferable than a simple transfer of technology, this process is helping provide farmers and communities with the tools they need to meet the evolving demands of sustainability (Catacutan *et al.*, 2000; Garrity *et al.*, 2003; ICRAF, 2001c).

Diversity, multiplicity and adaptability of ideas promoted by the program: Far from being a single-focus movement, the ATSAL and Landcare projects are promoting many types of technologies, styles and forms of community

organizing, and, to a lesser degree, policies for effective natural resource management. It would seem that the primary reason for this is the experimental approach used in such a research and development program, in which applied research helps tailor solutions to the local context (Mog, 2003). Thus, in conducting its projects, ICRAF has had the liberty to try many new things and to allow the movement to evolve and grow in unexpected directions (Garrity, Amoroso, Koffa, & Catacutan, 2001).

It was observed that, as a result of this approach, the community groups which have emerged out of the projects are organized around everything from tree nurseries to mushroom-farming to stream-bank restoration to timber and tree seed production to livestock-raising. They were also seen to operate at a wide range of scales from a few neighbors banning together, to village-level groups, to organizations attempting to create change throughout the municipality. In interviews, their members report being exposed to, experimenting with, and adapting conservation farming and agroforestry techniques ranging from ridge tillage to contour and hedgerow farming to perennial/annual intercrops to integrated pest management to organic fertilizer composting.

Accounting for heterogeneity, diversity and dynamism: ICRAFs community organizing work represents an inspiring alternative to the one-size-fits-all model of extension and technology transfer. ICRAF goes beyond simply having a non-discriminatory approach and directly investigates the ways in which household and community needs and circumstances vary. Program staff were observed exploring these issues by regularly engaging the community in mutually respectful dialogue, conducting field trials of various species and techniques, and monitoring Landcare projects. The investigation of local conditions was an even more formal component of ICRAFs work in the years leading up to ATSALs formation (Garrity *et al.*, 2003). Ultimately, however, it is the highly participatory nature of the projects which best ensures their inclusiveness, dynamism and accounting for local variability. When local groups are granted control of their own agendas, programs can easily avoid a ''blueprint'' approach and ensure that they will remain relevant and responsive to the different and evolving needs of the people (Wijayaratna, 2002).

Understanding and use of local knowledge, skills, initiative and constraints: Again, the work of ICRAF in Lantapan stands out for its ability to tap into local knowledge, skills and initiative, while gaining an appreciation for local constraints. ICRAF is fully aware of the central role of local people in creating change and, as a result, their organizing work ''is based on the farmers' innate interests'' (Garrity & Mercado, 1998, p. 1). ICRAF benefited from the initial research by other SANREM CRSP/SEA collaborators into local knowledge, skills, initiative and constraints, and explicitly continued such investigations throughout the organization of ATSAL and Landcare (Garrity *et al.*, 2001; Koffa & Garrity, 2001). The direct results of this approach can be seen in the interview data: 62% of Landcare interviewees said that at least some of the ideas promoted by Landcare were indigenous; and when asked if ICRAF uses and investigates local knowledge and interests, all but one ATSAL member agreed.

Recognizing the influence of external conditions, markets and policies: While these projects may be primarily concerned with what takes place within Lantapan, there is little evidence to suggest that this is in any way hampering an understanding of the broader context and the influence that external conditions, markets and policies may have on the municipality. For one thing, the SANREM CRSP and ICRAF are both global institutions with research and development programs extending well beyond the borders of Lantapan, Mindanao, or the Philippines. This position grants them the ability to grasp larger trends and avoid the pitfalls of smaller organizations that might be more likely to operate locally without being cognizant of the role of external influences (Coxhead, Rola, & Kim, 2001b).

The process of organizing ATSAL clearly reflected ICRAFs concern for external factors. In fact, ICRAF devoted a great deal of research and extension resources to helping Lantapan tree farmers and seed collectors understand the conditions and demands of agroforestry product markets in the region, the nation, and around the world (Koffa & Garrity, 2001). In the case of Landcare, though organizing neighborhood-level community groups is the focus, it is being done in conjunction with efforts at the municipal, provincial, and regional levels, as well. The intent has been to not only effect policy changes that are supportive of Landcare, but to help local-level community groups network with external institutions and markets to increase their likelihood of success (Garrity *et al.*, 2001).

In conclusion, this study demonstrates that, if development programs are to be sincere about promoting sustainability, they need to focus less on producing particular outcomes and more on designing and implementing projects that are firmly grounded in the types of process elements listed in Table 1. Ultimately, good process will lead to good outcomes.

NOTES

1. See also: Bell and Morse (2003), Brinkerhoff and Goldsmith (1992), Campbell (1994), Cramb, Garcia, Gerrits, and Saguiguit (2000), Dresner (2002), Stockmann (1997) and van Pelt (1993).

2. See also: Kaplan (2000), Lélé (1991), Lightfoot *et al.* (2001), Uphoff *et al.* (1998) and van Pelt (1993).

3. It has also been widely demonstrated that community organizing can act as a means of achieving many of a program's more immediate goals by helping to diffuse information and technology, facilitate participation, improve decision-making and conflict resolution, mobilize local human and material resources, create social and political energy, provide the conditions for local empowerment, and strengthen civil society (Garrity, 1999; Garrity & Sumbalan, 2000; Mercado *et al.*, 1998; Mercado, Patindol, & Garrity, 2000; Uphoff *et al.*, 1998).

4. See also: Garrity (1999), Garrity *et al.* (2003), Harrington (1995), Koffa and Garrity (2001), Krishna and Bunch (1997), Mercado *et al.* (1998), Mercado *et al.* (2000), Neill and Lee (1999), Reading and Soussan (1989), and Uphoff *et al.* (1998).

5. This is of particular interest to funding agencies which have difficulty justifying continued expenditure without evidence of progress toward program goals.

6. See also Deutsch, Orprecio, and Bago-Labis (2001) and Garrity *et al.* (2003).

7. See Becerra (1995), Casley and Kumar (1988), Casley and Lury (1987), Geran (2001), Kaplan (2000), Narayan (1996) and Parthasarathy and Iyengar (1998).

8. See Becerra (1995), Casley and Kumar (1988), Casley and Lury (1987), Cramb *et al.* (2000), Geran (2001), Hulme and Taylor (2000), Kaplan (2000), Moncada, Zamora, Kubberud, and Claussen (1998), Narayan (1996), Parthasarathy and Iyengar (1998), Pretty (1995), Stockmann (1997) and Wainwright and Wehrmeyer (1998).

9. See Casley and Kumar (1988), Casley and Lury (1987), Cramb *et al.* (2000), Geran (2001) and Wainwright and Wehrmeyer (1998).

10. As reported by Buenavista, Coxhead, and Kim (2001).

11. Logistic regression operates on the assumption that all respondents have a common probability of answering correctly and provides a variance of the estimated proportion, allowing for statements about the significance of the difference between groups.

12. As one example of this commitment to institutional flexibility, ICRAFs Southeast Asia Regional Coordinator and Director-General Designate, Dennis Garrity, explained in an interview: "A strong element of [Landcare's] potential sustainability is the flexibility of it. People have been concerned and have said, 'Yeah, but if you allow Landcare to go off beyond soil and water conservation practices, how are you going to ensure that farmers continue to maintain a commitment to that? They'll get interested in other things.' Well, I say, '. . .It could happen and why should we control that? They started the group because they were concerned about soil and water conservation, but if it happens that they're not concerned about it later, should we, in some top-down way, resist it? Perhaps not.".

13. For example, during interviews, over 95% of all Landcare and ATSAL members said that participation in the program encouraged on-farm experimentation and informal information exchange among farmers. See Mog (2003) for more details.

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